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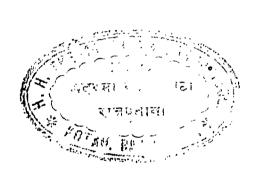
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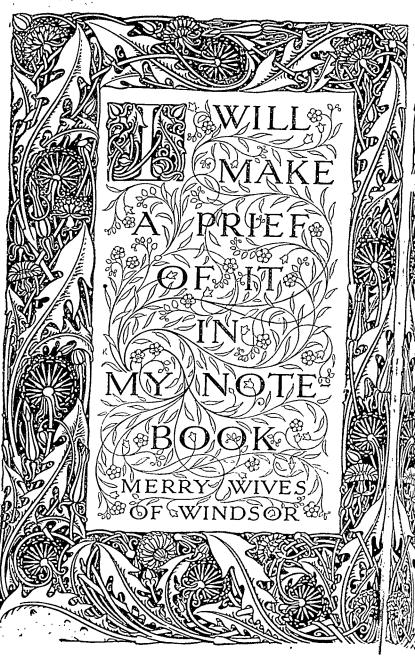
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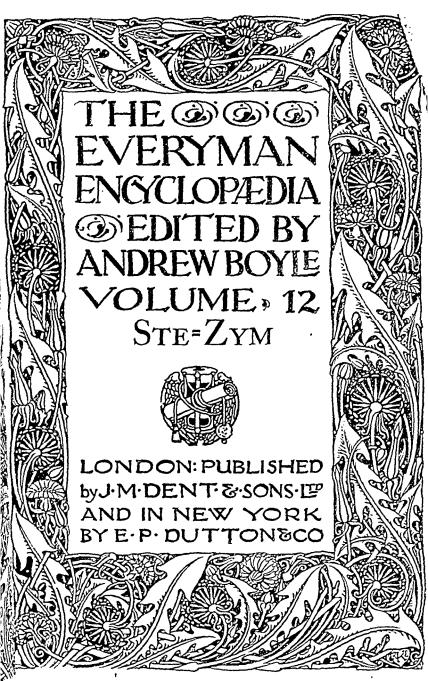


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LIST OF ABBREVIATIONS

ac., acres. A.D., after Christ. agric.. agricultural. ambas.. ambassador. ann., annual. arron., arrondissement. A .- S., Anglo-Saxon. A.V., Authorised Version. b., born. B.C., before Christ. Biog. Dict., Biographical Dictionary. bor., borough. bp., birthplace. C., Centigrade. c. (circa), about. cap., capital. cf., compare. co., county. com., commune. cub. ft., cubic feet. d., died. Dan., Danish. dept., department. dist., district. div., division. E., cast : castern. occles., ecclesiastical. ed., edition; edited. c.g., for example. Ency. Brit., Encyclopædia Britannica. Eng., English. estab., established. et seq., and the following. F., Fahrenheit. fl.. flourished. fort. tn., fortified town. Fr., French. It., feet. Ger., German. Gk., Greck. gov., government. Heb., Hebrew.

Hist., History.

i.e., that is. in., inches. inhab., inhabitants. Is., island, -s. It., Italian. Jour., journal. Lat., Latin. lat., latitude. 1. b., left bank. long., longitude. m., miles. manuf.. manufacture. mrkt. tn., market-town. Mt., mts., mount, mountain, -a. N...north : northern. N.T., New Testament. O.T., Old Testament. par., parish. parl., parliamentary. pop., population. prin., principal. prov., province. pub., published. q.v., which see. R., riv., river. r. b., right bank. Rom., Roman. R.V., Revised Version. S., south : southern. sev., several. Sp., Spanish. sp. gr., specific gravity. sq. m., square miles. temp., temperature. ter., territory. tn., town. trans., translated. trib., tributary. U.S.A., United States of America. vil., village. vol., volume. W., west; western. yds., yards.



Stevens Point, a tn. on the Wiscon; Tonderghie, Physgill, and Glenturk sin, 150 m. N.W. of Milwaukee, in Stewarts; (4) James, ancestor of the Portage co., Wisconsin, U.S.A. Pop. Lords of Lorn and the Stewarts of

(1910) 8692.

Stevenston, a tn. with ironworks and Nobel's explosives factory, 1 m. from Saltcoats, on the Firth of Clyde, in Ayrshire, Scotland. Pop. (1911) 10,733.

Stevenston, a tn. with ironworks and Nobel's explosives factory, 1 m. Stewarts of Allanton and Coliness. Other earldoms were acquired by the family at different times, c.g. those 10,733.

Stevenston, a tn. with ironworks and Marions of Athole, Buchan, and Traquair. Stevenston, a tn. with steward, and Marions of Appin and Grandtully; (5) John; (6) Hugh; (7) Robert, ancestor of the family at different times, c.g. those family at different times, c.g. those in the first royal Stewart was the son of sixth steward, and Marions.

ixth steward, and Marjory.
of Robert the Bruce, and
he Scottish throne as Robert Prince Maurice of Orange, and held II. in 1371. From his natural son are several civil offices. He appears to descended the Steuarts of Dalmuise have invented a carriage with sails, and the Stewarts, Marquises of Bute; to have originated systems of defence from a natural son of Robert III., by sluices and artillery, and to have the Shaw-Stewarts of Blackhall and introduced book-keeping by double Greenock, and from illegitimate sons entry and the use of decimals. introduced book-keeping by double entry and the use of decimals.

Steward, Lord High, see High of Alexander, Earl of Buchan, fourth Steward of the Household, Lord, in England, is the chief officer of the ancient court of the Board of Green Cloth, and was originally called the Lord Great Master of the Household. He has power over the finances of the royal household, and controls and selects all officers and servants execpt those of the chapel, chamber, and stable. He receives his charge from the sovereign, and holds it during pleasure.

Greenock, and from illegitimate sons of Alexander, Earl of Buchan, fourth of Alexander, Earl of Buchan, fourth and St. Fort. The direct royal male line ended at the death of James V. His daughter Mary, who adopted the spelling 'Stuart,' claimed of Lord Great Master of the Household. He throne of England on account of descent from Margaret Tudor, Queen of James IV., and her son, James VI., send the throne of the royal line of Great Britain. The Stuarts were excluded from the sovereign, and holds it during the Commonwealth (1645-60), and after the flight and stable. He receives his charge, Britain. The Stuarts were excluded from the sovereign, and holds it during from the throne during the Commonpleasure.

Stewart, a mining vil. of the Casslar dist., British Columbia, Canada, at the head of the Portland Canal and the line was permanently debarred. The head of the Portland Canal and the line was permanently debarred. The head of the Portland Canal and the line was permanently debarred. The head of the Portland Canal and the line was permanently debarred. The high district. Pop. (estimated) 3000. William of Orange, son of Mary, the ing district. Pop. (estimated) 3000. daughter of Charles I., and they were stewart, Stewart, Stewart, or Stuart, House steward them the son between the son substitution of James II. The male line of scent from a Breton immigrant, Alan James II. ended with the death of his the Song Flaald, in the 11th century. Sons. See works by Crawfurd (1710), His son Walter (d. 1177) was made Steward of Scotland by David I., and founded Paisley Abbey in 1163. The stewardship remained in the family, Stewart, Alexander (1829-1901), a stewardship remained in the family, Scottish author and naturalist, born the various branches of which are descended from the sons of John Gaelle Church, Paisley, and at Balckilled at Falkirk, 1298). John had seven sons (1) Alexander, ancestor of the Earls of Galloway, and the Stewart, Alexander Turney (1803-1901), a St

76), an philanthropist, born at Lisburn, Ireland; emigrated to New York in 1823 and opened a dry-goods store in 1825. His business grew to very large proportions and was removed to Broadway. He sent provisions to the sufferers in the Irish famine of 1846 and the French sufferers from the Franco-German War, and was noted for his charitable acts.

Stewart, Balfour (1828-87), a physicist, born at Edinburgh. He became director of Kew Observatory (1859-71), was made an F.R.S. in 1862; became secretary to the Government Meteorological Committee in 1867; professor of Natural Philosophy at Owen's College, Manchester (1870). He made researches into radiant heat, sun-spots, and periodic irregu-larities in terrestrial and solar phenomena. He wrote The Unseen Universe.

Stewart, David, see ROTHESAY, DAVID STEWART, DUKE OF. Stewart, Sir Donald Martin (1824-1900), a British soldier. He became an ensign in the Bengal Native Infantry (1840), major (1866), general (1881), and field-marshal (1894). He -58), ser 1867in

68) -80). He was commander-in-chief in India (1880-85), and a member of the Council of India after 1885.

Stewart, Dugald (1753-1828), Scottish philosopher, was the son of Matthew S., the geometrician. He was appointed in 1785 professor of moral philosophy in Edinburgh Uni-versity, but though he retained the chair until within eight years of his death, he did not lecture after 1809. He acquired a great reputation by his works, which include: Elements of the Philosophy of the Human Mind, 1792-1827; Outlines of Moral Philosophy, 1793; and Lectures on Political Economy. His works were collected Economy. His works were collected by Sir William Hamilton (1854-60). There is a biography by John Veitch (1858).

Stewart, Sir Herbert (1843-85), a British general, in 1863, and He became ensign deputy - assistant eneral in Bengal quartermaster - general (1872-73). He entered the staff college, and the Inner Temple in 1877, was brigade-major in Natal (1879-80), military secretary to Wolseley (1880), assistant aide-de-camp in (1882), and served in the Suakin campaign, the Gordon Relief Ex-pedition, and at Abu Klea, where he

American millionaire and under the influence of Livingstone. and in 1860 set about the establishment of a mission in Central Africa. He went to Africa in 1861, spentages. time with

and after interior, ret

He went back to Africa in 1866; became principal of the Lovedale Missionary Institute (1870), founded the Blythswood Mission Institute at Transkei and Livingstonia (1875), and a new mission in E. Africa (1891).

Stewart, Sir John, see Lennox. Stewart, Matthew (1717-85), Scottish mathematician, educated at Glasgow, and at Edinburgh under minister of professor of

being assisted by his son Dugald after 1772, and was made an F.R.S. in 1764. The book which made his reputation was General Theorems reputation was General Theorems (1746), and his chief work: Tracts, Physical and Mathematical (1761),

dealing with astronomical geometry.
Stewart, Patrick (1832-65), British soldier. He became lieutenant in the Bengal Engineers (1854) and brevet-major (1858), and was attached to the headquarters staff at Lucknow (1857-58). He went to Allahabad with Lord Canning (1858), served on the Cholera Commission (1861-62), and became director of the gov. telegraph at Bombay (1863).

Stewart, Robert, see CASTLEREAGH. Stowart, Sir Thomas Grainger (1837 -1900), a Scottish physician, educated at Edinburgh, Berlin, Prague, and Vienna; was president of Royal F.R.S.E.

of physic sician in in Scot-

land (1882), and prometal College of and president of the Physicians (1889); knighted in 1894.

Stewart Island, or Rakiura, an island off the S. coast of South Is., New Zealand, crossed by 47°S. Area 665 sq. m. The coast is deeply in-dented and Paterson Inlet and Port Pegasus are good harbours. It is Pegasus are good harbours. It is sparsely inhabited by whalers and natives.

Stewarton, a tn. of Ayrshire, Scotland, on R. Annock, 5 m. N.W. of Kilmarnock. Has dyc-works and manufs, of hosiery, caps, and carpets. Pop. (1911) 2841.

Stewartry, a name given in Scot-land to crown lands governed by a pedition, and at Abu Klea, where he steward, i.e. a deputy appointed by the king, who had considerable civil major-general before his death.

Stewart, James (1831-1905), an African missionary and explorer, born at Edinburgh; educated there and at St. Andrews. In 1857 he came retaining the name is Kirkcudbright. Austria, at confluence of rivers Enns and Steyr, 20 m. S.E. of Linz. It is a quaint town with a mediaval castle, and is now an industrial centre, hav-

sing manufs. of iron, steel, arms, and knives. Pop. 17,442.
Steyn, Martin (b. 1857), the last president of the Orange Free State before the annexation by the British in 1900. He was born in South Africa, was educated in Holland, and studied law at the Inner Temple, to which he was admitted in 1882. He was elected to the presidency of the Orange Free State in 1896. During the Boer War he acted as a general and led the peasant army of the Free

State. He was a member of the Peace Conference of Klerksdorp, but did not sign the surrender at Pretoria.
Steyning, a tn. of Lewes div. of Sussex, England, 121 m. S. of Horsham and 5 m. from the coast. It was formerly a seaport, the ancient Portus Cathmanni. It contains a grammar-school, founded in 1614, and has cattle fairs. Pop. (1911) Pop. (1911) 1800.

Sticklebacks, or the members of the family Gastrosteidæ, are spiny-rayed Lemibranch fishes of the sub-order Catosteomi. They are small, and have clongated, compressed slender bodies, always without scales, but often protected by means of bony scutes. The anterior dorsal fin is represented by isolated spines, and the ventral fin is formed of a strong spine and one or two soft rays. The S. are noted for their nest-building habit, the males constructing them of leaves, twigs, and grass, and binding them together by a mucus which they secrete. They subsequently guard their young with great care. Nearly all the species are found in fresh water in Europe, Asia, and America, are very pugnacious, and feed on spawn of other fishes. Gastrosteus aculectus, and G. pungi-tius can live in either fresh or salt water: G. spinachia (or S. vulgaris) is entirely marine. The flute-mouths or pipe-fishes which form the family Fistularide have been described as gigantic marine sticklebacks? closely resemble species of trosteldæ.

Stieglitz, Christian Ludwig (1756-1836), a German writer on art subjects, born at Leipzig. His works include: History of Architecture from the Earliest Antiquity to Modern Times, 1827: Archoology of the Architecture of the Greeks and Romans: and Stiglmayov. Johann Baptist (1791-1836), a German William Ludwig (1756-1836), a German writer on a the Greeks and Romans: and Stiglmayov. Johann Baptist (1791-1836), a German writer on art subjects, born at Leipzig of the Greeks and Romans: and helped to crown him in 1066. In 1070 he was charged with various ceclesiastical offences by the papal ce tecture of the Greeks and Romans; and On the Pigments used by Ancient Artists. He also composed some popular war songs.

Stieler, Adolf (1775-1836), a German cartographer, born at Gotha,

Steyer, Steyr, or Steir, a tn. of Upper | the government service (1797-1836). His chief work was Der Handatlas, 1817-23 (75 plates) (new ed. 1904). He also published Schulatlas, 1821; and Kleines Allas der Deutschen

Staaten, 1876. Stier, Rudolf Ewald (1800-62), a German theologian, horn at Frau-stadt, Posen. In 1850 he was appointed superintendent at Schkeuditz, and in 1859 at Eisleben. Among his works are: The Words of the Lord Jesus, 1843 (Eng. trans. 1855-58): Words of a Risen Saviour (trans. 1859); Words of the Angels, 1862; and Words of the Apostles. See Life by his

sons (1868). Stifel (or Stifelius), Michael (1486-1567), a ciple of :

became . monaste.

by Luther, and in 1820 left the monastery and went to study at Wittemberg. He lost his first pastorate at Lochau by foretelling the immediate end of the world in Rechenbeichlein vom end Christi, 1542. He became professor at Jena and wrote Arith-

melica Integrá.

Stiff-neck, a rheumatic affection of the muscles of one side of the neck, causing the head to be drawn to one side. S., as the term is ordinarily applied, is usually brought on by exposure to cold or wet, and especially affects individuals with a rheumatic diathesis. Movement gives rise to pain, and occasionally there may be spasm, causing the head to be immovable for the time being. Hot fomenta-tions and general rheumatic treat-ment are indicated. Torticollis, or congenital S., is due to a defect of the sterro-mastoid muscle, usually through injury at birth.

Stigand (d. 1072), an English pre-late. He was made Bishop of Elmham, 1038, and reinstated after de-privation in 1044. In 1047 he became Bishop of Winchester, and undertook negotiations between Edward the Confessor and Godwin (1051-52). He was uncanonically appointed Arch-bishop of Canterbury in 1052, and was accordingly excommunicated, but received the pall from Benedict V. in 1058. He submitted to William

Stiglmayoy, Johann Baptist (1791-1844), a German engraver and sculp-Born near Munich, studied in tor. Italy (1819), and on returning in 1824 became superintendent of the Munich man cartographer, born at Gotha, bronze-foundry. His works include a where he was afterwards employed in bust of Lewis, King of Bavaria, after

Thorwaldsen's model; the monument | Honorious. to Schiller at Stuttgart, also after Thorwaldsen, the statues of the Bavarian prince in Munich Palace, after Schwanthales, and the statue of the Elector Maximilian, after Thorwaldsen.

Stigma, in botany, the terminal part of a carpel. When the overy consists of several united carpels, it is usually possible to detect the number of component carpels by the corresponding number of Ss. In shape they may be round, square, feathery, or petaloid.

Stigmaria, the roots of Lepidodendron and Sigillaria, two genera of fossil trees which are common in coal. They vary in width from 2 ft. to an inch and in length are sometimes as much as 30 ft. That they are true roots is disputed by some authorities, | feld, specialising on eye diseases. who class them as underground stems and rhizomes, but most are agreed that they are the ancestors of the

modern Selaginellas.

Stigmatisation (Medieval Latin, stigmatisater, from Gk. στίγμα, a mark, puncture), the impression on certain individuals of the 'stigmata' or marks which Jesus received in his Passion, generally held to be given miraculously as a mark of signal favour to those specially devoted to meditation on the Passion. St. Paul's words in Gal. vi. 15 cannot be taken as a distinct assertion that he bore the stigmata. The earliest and the most striking instance is therefore that of St. Francis of Assisi, of which full accounts are given in his life. Since that time some hundreds of instances have been collected, especially during the last century. The case of Louise Lateau (1850-83) is particularly noteworthy on account of the discussion it evoked. It may well be that the miracle is connected with powers of suggestion and hypnotism. Gourbeyre, Les Stigmatisés, 1894.

Gourbeyre, Les Snyman.

Gibine River, Stickine,

N. Ameri Stickin, Stickeen, a river of N. America, rising in Cassiar, British Columbia, and flowing about 500 m. S.W. to its mouth in Alaska. Navigable for 150

miles.

Stilbite, a zeolite consisting of hydrated silicate of aluminium and lime. It is monoclinic, usually in flattened crystals or sheaf-like aggregations, white in colour (sometimes red) and showing a pearly lustre on cleavage faces (hardness 3'5-4; sp. gr. 2'2). Occurs in cavities in igneous rocks Ireland, Scotland, and Iceland, etc.

Stilicho, the son of a Vandal captain, became one of the most distinguished generals of Theodosius I.,

He was put to death at Ravenna in 408. He was the patron of the poet Claudian, who addressed an historical epic to him, On the Consulate of Stilicho.

Still, see Distribation.

Still, John (1543-1608), an English prelate. He was rector of Hadleigh (1671), canon of Westminster (1573), Master of St. John's College, Cam-bridge (1674), and of Trinity (1677), Bishop of Bath and Wells (1593). The authorship of Gammer Gurton's Needle has been ascribed to him.

Stillborn, see Obstetrics, Fotus,

Abortion, etc.
Stilling, Johann Heinrich, or Jung
Stilling (1740-1817), a German mystic,
box of Carlot III.

where he where he

at Elberwas a professor at Kaiserslautern (1778), Marburg (1787), and Heidel-berg (1804), later lived in retirement as a leader of the Pietists. His works, including the autobiography, Lebensgeschichte (1777-1804), and various mystical books, were published in 12 vols., 1843-44.

Stillingfleet, Benjamin (1702-71), a botanist and writer, grandson of Edward Stillingfleet (q.v.). Educated at Trinity College, Cambridge, and be-came tutor of William Ashe-Wind-ham. In 1741 he explored the Mer de Glace at Chamounix. He obtained the patronage of Lord Barrington. He proposed English names for grasses and introduced the Linneau system.

Stillingfleet, Edward (1635-99), an English prelate. He became a fellow of St. John's College, Cambridge, of St. John's College, Cambridge, 1653, M.A. (1656), D.D. (1668), and was incorporated at Oxford (1677). In 1667 he became prebendary of St. Paul's, London, in 1669 canon of Canterbury, in 1677 archdeacon of London, in 1678 Dean of St. Paul's, and in 1689 Bishop of Worcester. He was a popular preacher, and acted as chaplain to Charles II. His works include The Islands Santa

and Origi Stillma. ж. 1901), an American painter and journalist, born at Schenectady, New York ; studied art under F. E. Church, and in 1850 went to England, where he met Ruskin and Turner and come under the influence of Rossetti and Millais. In 1852 he went on an unsuccessful mission for Rossuth to dig up the buried Hungarian crown jewels. On returning to America he devoted himself to landscape painting and founded the Crayon. He lived for some time at Cambridge, Mass., then went to on whose death he became the real London, visited Switzerland with Rusruler of the W. under the emperor kin, lived in France, became U.S.A.

(1865), and settled in Athens in 1868.

He acted as Times correspondent in Herzegovina (1875), at Athens (1877-83), and at Rome (1886-98).
Stillwater, the cap. of Washington co., Minnesota, U.S.A., on St. Croix R., 16 m. N.E. of St. Paul. It is at the head of navigation on the river, has a large lumber trade and numerous manufactures. Pop. (1910) 10,198.

Stilpo, a Greek philosopher of the Megarian school, who lived about 300 B.C. He followed the practical ethics of the Cynics. See Seneca, Epistle ix.

Stilt, a term applied to any species of *Himantopus*, a genus of Chara-driidæ, which has a very wide distribu-The name is given to these birds by reason of their extremely long legs, which give them a somewhat ludicrous appearance when in H. candidus is seen at times in Bight.

H. candidus is seen at times in Britain; H. melas inhabit New Zealand,
and H. brasiliensis S. America.

Stilton, a vil. of Huntingdonshire,
England, 7 m. S.W. of Peterborough.
It gives its name to a cheese made in
Leicestershire and originally sold
here Pon (1011) 550

here. Pop. (1911) 550.

Stilts, poles provided with stirrup-like projections for the feet at a certain distance from the ground, and used for walking over rough or marshy Stilt-walking has been for places. long, and still is, a form of amusement. S. are used regularly in Landes, a district of Gascony, and the Mar-quesas and other Pacific Is., and stilt-races are a favourite feature of festivities in the former locality. They also figure in Italian masquerades.

Stimulants, agents that increase nctional activity. They may be functional activity. general, exciting the body as a whole to greater activity, or may affect particular organs, as cardiac, renal, hepatic, gastric, cerebral, and other S. They are distinguished from tonics by their more immediate and transient action. It often happens that while a small dose of a S. causes greater intensity of vital processes, a larger dose or repeated small doses Thus. tend to cause depression. alcohol is an effective S. in moderate doses, but if its use be continued, the vital processes become much depressed, so that collapse is an important symptom of alcoholic poisoning. The most common S. are alcohol, ether, chloroform, ammonia, tea, coffee, various essential oils, electricity, heat and cold under certain conditions, etc.

Sting Fish, see WEEVER.

Stinging Plants. and Animals the power of inflicting a wound and the parish and the state of the free

consul at Rome (1861) and at Crete introducing a poisonous fluid is employed by many animals as a means of securing their prey. One of the lowliest stinging animals is the hydra which has a number of cells in the tentacles (see STINGING CELLS). A lobe of the spittle gland in gnats is modified for the secretion of poison. Bees, wasps, ichneumon and saw flies inflict their stings by means of modified The poison glands of ovipositors. spiders are in appendages near the A number of fishes, notably mouth. the sting rays and the weevers, have also stinging powers. Stinging plants (e.g. nettle) are usually furnished with sharp stiff hairs which secrete an acrid fluid. Some are capable of causing serious results.

Stinging Cells, or Cnidoblasts, occur in Coelenterates as bulb-shaped structures containing fluid and having the narrower end prolonged into a fine tube folded inwards in the cavity of the bulb as a spiral coil. Externally the cell bears a conical projection (cnidocil), and when a small animal comes in contact with this the fine tube turns inside out and is shot into the animal's body, becoming fixed by barbs at the base of the tube while

poison passes through it.

Sting-rays, or Whip-tailed rays, are the fishes which constitute the family Trygonidæ in the sub-order Raji. There are about fifty species of these elasmobranchs, occurring in most tropical and subtropical seas, and they are characterised by their long, slender, whip-like tails.

Stinkstone, or Swinestone, is a limestone which gives off a feetid smell (sulphuretted hydrogen gas) when

struck with a hammer.

Stinkwood, a term applied to the wood of numerous plants, is used especially in reference to Gustavia augusta, a species of Lecythidacæ. The wood has a feetid smell, and the tree occurs in tropical America.

Stint, the name given to several species of sandpiper in the genus Tringa of the family Charadrildee, and all are related to the dunlin. T. minuta, the little S., is a small bird

often seen in Britain.

Stipa Pennata, sec FEATHER GRASS. Stipend, originally the pay soldiers; but now means the annual allowance or income of an ecclesi-astical benefice, though in a wider sense it denotes any settled pay for services whether daily, monthly, or annual. In Scotland the term applied specifically to the provision made for the support of the parochial ministers of the old Established Church, consisting of payments made in money Though commonly used as a means or (formerly) grain, or both, varying of defence both in animals and plants in amount according to the extent of

teinds (see Teinds), or of any other in 1626 Secretary of State for Scotfund specially set apart for the pur-All Ss. which come short of pose. £150 per annum are made up to that sum from Government funds. In the Roman Catholic church S. also denotes the fee which a priest is entitled to demand for saying mass. pendiary ' in a wide sense means one who performs services for a settled compensation, but has come specifically to denote a paid police magistrate acting in the metropolis or large provincial towns. See POLICE.

Stipules, in botany, are outgrowths often seen at the base of a leaf, as in the rose or pea. They are frequently large and leaf-like, when they perform the assimilative functions of a leaf, at other times they are brownish in colour, and protect the young leaves when in the bud, and in the Robinia they are modified to form

protective thorns.

Stirbey, or Stirboi, Barbo Demetrius, better known as Prince Bibescu (1801-69), a statesman, was a native of Rounania. He held the offices of Minister of the Interior, and from 1849-56 was hospodar of Wallachia.

Stirling, a royal and parl, burgh, river port, and the cap. of Stirlingshire, Scotland, 31 m. V.N.W. of Edinburgh, on the Forth. The historic connections of the town are many, its castle having been the scene of several attacks and also the birthplace and residence of several Scottish kings. The field of Bannockburn, which can be seen from the castle walls, is also famous for its battle in 1314. The chief manufs, are leather, tartans, carpets, and woollen goods. Pop. (1911) 21,200.

Stirling, James Hutchison (1820-1909), a Scottish philosopher and writer, was a native of Glasgow, and was educated at the university there, and at first practised as a doctor. He is the author of: The Secret of Hegel, 1865; Textbook to Kant, 1881; Sir William Hamilton: being the Philosophy of Perception, 1865; As Regards Protoplasm; Reply to Huxley, 1872; What is Thought? 1900; The Cate-gories, 1903. See Life by his gories, 1903. See Life by his daughter, Amelia H. Stirling, 1911.
Stirling, Mrs. Mary Anne (1815-95).

an English actress; began her career on the London stage, some of her most successful parts being those of Peg Woffington, Mrs. Malaprop, and the nurse in Romeo and Juliet. In 1833 she married Edward S., and afterwards Sir Charles Gregory (1894). She left the stage in 1870.

land. He was made Earl of Stirling in 1633. He was the friend of Drummond of Hawthornden, and belonged to the same school of poetry. He has written: Darius, 1603; Crasus, 1604; The Alexandraan Tragedy, 1605, and Julius Cæsar, 1607, known collectively as the Monarchicke Tragedies: Aurora, 1604; A Parenesis to the Prince, 1604; Doomesday, 1614. Stirling-Maxwell, Sir William, see

MAXWELL

Stirlingshire, a S.-central co. of Scotland, situated between the Firths of Forth and Clyde, is bounded N. by Perthshire, S. by Lanarkshire and Dumbartonshire, E. by the Firth of Forth and Linlithgowshire, and W. by Dumbartonshire. Area 151 sq. Pop. (1911) 161,003. S. is one of the most picturesque counties of Scotland, and may be described as mountainous, lying as it does on both sides of the boundary line between the highlands and lowlands, although there are two large plains in it known as the carses of Falkirk and Stirling. The Lennox Hills, known also as the Campsie Fells and Fintry Hills. traverse the co. from W. to E. and reach an altitude of 1500 ft. Ben Lomond, in the N.W. of the co., is 3191 ft. high, and stands on the banks of the famous Loch Lomond. of which about one-half belongs to the county. Other lakes are small but Loch Katrine touches the N. border for two miles. The principal rivers are the Forth, Avon, Teith, Carron, Devon, Alian, and Bannock. S. is wealthy in minerals, having large seams of good quality coal, while ironstone, sandstone, limestone are found in abundance. There are fine grazing lands on the plains, sustaining a great quantity of sheep and cattle. Agriculture flour-ishes most near the banks of the Forth, where large crops of oats and beans are raised. There are several manufacturing centres where a great many people are engaged in the woollen and calico printing industries. Iron founding (mainly at the Carron ironworks), brewing, and distilling are also carried on. Stirling is the capital, and Grangemouth, where shipbuilding is engaged in, is the principal port. S. returns one principal port. S. returns one member to the House of Commons. Numerous battles have been fought in this co., viz., Stirling Bridge (1297).
Falkirk (1298 and 1746), Banuockburn (1314), and Kilsyth (1645), the latter resulting in the defeat of the Covenanters. James 111, of Scotland Stirling, William Alexander (1567-Covenanters, James III, of Scotland 1640), a Scottish poet, born at Menstrie, and obtained part of his education on the Continent. In 1614 Ninumo, History of Stirlingshire. 1880, he became Master of Requests, and

Stitch, a sharp pain in the side. It may be caused by pleurisy, by spasm of the respiratory muscles during violent exercise, or by intercostal neuralgia.

Stitchwort, sec STELLARIA.

Stiver (Dutch Sluiver), the name of two coins formerly used in Holland, but the term is now applied in Great Britain and America to denote coins of small value, such as a cent or a halfpenny.

Stjornhjelm, Georg (1598-1672), a Swedish poet. After travelling in Europe, he received an appointment at Dorpat, and eventually became a friend of Queen Christina, who made him poet laureate. He also occupied the office of judge in Sweden. Among his works are: *Hercules*, 1653 (a didactic poem); Bröllops-besvärs hugkommelse.

Stjernstolpe, Ionas Magnus (777-1831), a Swedish writer, born of poor parents. He managed, however, to obtain a good education, and in 1801 became tutor to the sons of a wealthy merchant, M. Bessow. He then de-voted a great deal of his time to

translations.

Stoat, or Ermine (Mustela erminea), carnivorous mammal, native of Britain, with a much clongated body covered with short fur which gener-ally retains its reddish-brown colour in Britain, but in colder latitudes becomes partially or wholly white and much denser, and is then highly valued by furriers. The S. is about 10 in. long, with a black-tipped tail about 5 in. long. It destroys enormous numbers of rats and mice, and this service is probably worth the loss the S. causes by destruction of game.

Stobæus, Joannes, a Greek writer, lived about 500 A.D.; collected frag-ments from many Greek writings, which have been handed down in two books - originally in one work known as the Florilegium. Edition by Wachsmuth and Hense (1884-94).

Stockade, in fortification, a line of stakes, posts, or trunks of trees set upright in the earth to form a defensive barrier, and generally loopholed to allow the defenders to fire.

Stockbridge: 1. A vil. of Hamp-shire, England, 8 m. W.N.W. of Winchester. It is a fishing resort, and has a racecourse. Pop. (1911) 860. 2. A tn. in Berkshire co., Massachusetts, U.S.A., 17 m. S. of Pittsfield. Ico Glen, Prospect Hill, and Lake Mahkeenao, the latter being in the vicinity of the house where Nathaniel Hawthorne wrote his works, are all places of interest. Pop. (1910) 1933.

in grain. Pop. 11,740.

Stock Exchange. The London S. E., colloquially termed the 'House,' is a private institution situated in Throgmorton Street, London, the business of which exclusively relates to stock and share dealings. The constitution of the S. E. is governed by a Deed of Settlement made in 1886, though the institution itself was founded before the close of the 17th century, and the management consists of an executive body of nine who represent the pro-prietors and act as landlords and enjoy the power of fixing at discretion the entrance fee and annual sub-scription payable by members and clerks. The proprietors themselves are the holders of shares in the original institution, the capital of which consists of 20,000 shares, £12 paid up, unlimited liability. managers have no power to control the business transacted in the S. E., nor have the shareholders of the institution any rights qua shareholders beyond their claim to dividend. The S. E. 'Committee for General Purposes,' comprised of thirty members elected (under Rule I. of the Rules of the Stock Exchange) annually by ballot by the members is the effective controlling body of the S. E. The committee is elected by the members, and no one can be elected unless he is, and has been, for the last five years a member of the S. E. The committee has wide disciplinary powers, which are a guarantee to the public that so far as the committee is concerned, or can be responsible, the members they deal with will act honestly and fairly. The business of the committee consists officially of 'routine' i.e. the election of members and the fixing of ordinary settling days, and 'special' i.e. the investigation of claims and other matters relating to the interests of the members or of the public. there are also a number of other important duties devolving on the committee, the chief of which are the fixing special settling days, granting official quotations, and acting as the sole tribunal for the adjudication of disputes concerning stock and share transactions between members, and as an optional court of arbitration in disputes between members and the outside public. The committee may expel or suspend indefinitely any member who violates the rules or regulations of the S. E., or fails to comply with the committee's de-cisions, or is guilty of disgraceful or dishonourable conduct; but the resolution for expulsion must be carried Stockerau, a tn. of Lower Austria, by a majority of two-thirds in a on the Danube, 64 m. N.W. of specially convened meeting consisting Korneuburg. It does a large trade of not less than twelve members, and also confirmed by a majority of the

public and a member are pending it is the practice of the committee not to intervene until the case has been disproceedings are pending the committee may hold a formal investigation, and the non-member is required to sign an agreement to refer the matter to the committee's arbitration and to be bound by its decision. No person can become a member of the S. E. who is not of age (see Infant). and, in addition, an applicant for membership must, prior to the ballot, be recommended by three members of not less than four years' standing, each of whom must bind himself to the £500 to applicant's creditors should he be declared a defaulter within four years from the date of his admission. The recommenders are asked whether they would take the applicant's cheque for £3000 in the ordinary course of business, and whether they consider of their own personal knowledge that he can be safely dealt with. After election members must, before exercising any privilege of membership, become a proprietor of the S. E. by obtaining at least three shares (if a nominated at least three stares (if a nominated member), or at least one share (if eligible for the waiting list, which includes only those who have served as clerks in the House or settling rooms for four years, with a minimum service in the House of three years). The members are divided into prokers we dishere to the town of the process. and jobbers (see Jobbers). A broker's business consists in buying and selling for the public on commission. As a rule a broker will deal in any class of security the client desires if he can find a jobber or dealer ready to buy or sell the required shares. The rate of commission varies with the class of security; though competition has compelled practically all brokers to follow a uniform scale. It is no concern of the jobber whether the broker is acting as a principal or as an agent, for by Rule 54 the S. E. does not recognise in its dealings any other parties than its own members; every bargain, therefore, whether for account of the member effecting it, or for account of a principal, must be fulfilled according to the Rules, Regulations, and Usages of the Stock Exchange'; and, as a rule, the jobber has, in fact, no knowledge of the person for whom the broker may be acting. A jobber may make bargains directly with the public, but if so, not in the House itself. As a rule, the jobber restricts his dealings to one class of securities, and takes his stand in that part of the House devoted by custom it would be somewhat difficult to dealings in his line of securities, comply' (Schwabe and Branson,

committee at a subsequent meeting, and known therefore as the 'market' Where legal proceedings between the for such securities. It is hardly necessary to say that no member can act in the dual capacity of broker and jobber, though, as at the bar, the member of one profession can change over and become a member of the allied profession, though the change from broker to jobber, or rice rersa, can be effected far more quickly than from barrister to solicitor, or rice versa. Partnerships between brokers and jobbers are forbidden by Rule 43, on the ground that the broker's duties towards his clients might conflict with his own personal interests (Schwabe and Branson, Law of the Stock Exchange). A jobber who has made a price is bound by the rules to deal at that price. When the broker names no amount, the jobber's quotation is only binding on him to the limit of £1000 stock, or ten shares if the value be under £500, or a number not exceeding that sum in value. It is the broker's duty to see that all bargains are made at fair prices for his clients, and that share or stock transfers are duly registered for them. Clerks in the S. E. are either 'authorised ' or ' unauthorised,' the former may, with the approval of the committee, transact business member, the latter may not, and may only attend on a member to check bargains. Authorised clerks must be over twenty years of age, have been clerk to a member for two years, and pay an entrance fee of fifty guineas, together with an annual subscription of thirty guineas. The entrance fee and subscription of an unauthorised clerk, who must be over seventeen years of age, are tenguiness and twelve guineas respectively. Members who find themselves unable to meet their engagements may be, but are not necessarily, expelled.

OFFICIAL QUOTATIONS: The Tape. The Official List is made up from the bargains marked. The official marking is made up from the tickets' recording the transactions effected between 11 AM, and 3 P.M. (transactions effected between 3 P.M. and 4 P.M. are called 'closing prices,' those effected after closing hours, 'street prices'). No transaction may be marked unless made in the House between members and at the real market price. No security may be quoted in the Official List without the permission of the committee; though such quotation is 'no guarantee that the concern to which the

tions in prices are recorded on the tape of the automatic machines of the Exchange Telegraph Company ('tape prices'). Most brokers are subscribers to this company, and have one or more 'tape machines' fitted

up in their offices.

DEALING ON THE STOCK EXCHANGE. Effecting a bargain with a jobber: A broker after receiving an order from a client must advise the latter of the sale or purchase by sending him a contract note showing the name of the jobber with whom he has effected the deal. By the Stamp Act, 1891, and amending Acts, the duty is 1d. where the transaction concerns a security of the value of £5 and under £100, and 1s. for £100 and over. Default in transmitting a contract note entails on the broker a penalty of £20, and if he sends a note without the proper stamp upon it, he forfeits his commission. Orders to deal in stock are in practice abbreviated, each £1000 nominal value being reckoned as 1, e.g. an order to buy '5 Great Northern,' means £5000 Gt. Northern stock. American railway securities are quoted in shares of 100 dollars each; thus 200 Union Pacs.=£4000 Union Pacific Railroad shares. In the absence of a special agreement, commission charges are according to a customary scale (as to which see Cordingley's Guide to the Stock Ex-change). By the custom of the S. Ex-a jobber may not ask the broker whether he is a buyer or a seller, and therefore he always names both his buying and his selling price (the difference between the two being the 'jobber's turn,' or 'turn of the market') when asked by the broker for a quotation; the object of which custom is to ensure the jobber making a proper quotation. A jobber may, but is not likely to, refuse to give a quotation. Quotations are usually made in £ and fractions of a £ rising by $\frac{1}{3}$ or more, e.g. $\frac{1}{3}$ of £=1s. 3d., $\frac{1}{3}$ = 11s. 3d., and $\frac{1}{3}$ = 18s. 9d. The jobber's turn varies according to the nature of the security and the state of the market; and where a security is being briskly deatt in, the jobber usually satisfies himself with a smaller 'turn' because of the greater facilities for cutting his losses by converse bargains.

Time bargains (for the account') and investments (for money').—
Buying for a permanent investment speaks for itself; the term 'speculative' in connection with S. E. dealing

Law of the Stock Exchange). Fluctua- securities to deliver, and either does tions in prices are recorded on the not intend getting them, or intends tape of the automatic machines to get them at a later date at a price lower than that at which he has agreed Such dealings being for a future date, the buyer can re-sell and the seller rebuy the same number of the same securities at any time before the date of completion; thus he himself merely pays or receives the difference in price between the two bargains. In the colloquial language of the S. E. a 'bull' is a person who buys securities to be paid for in the future in the hope that the price will rise and enable him to sell at a profit before the date of payment; a 'bear' is one who sells for delivery at a future date in the hope that the price will fall, and so enable him to rebuy at a lower price before the date of delivery. Time bargains are perfectly lawful, and, indeed, the great majority of transactions on the S. E. are of that class and not intended as investments.

Option.—Over and above the two ordinary modes of dealing of 'for money' and 'for the account,' there is a widely prevalent mode of dealing called 'option dealing.' Options are either 'puts' or 'calls.' A 'put' is the right to make the hyper civing the option take debuyer giving the option take de-livery at a future date of an agreed amount of some security at a fixed price. A 'call' is the right to make the seller deliver at a future date an agreed amount at a fixed price. The combined 'put-and-call' option gives the right either 'to put' or 'call.' This system is advantageous in that the profit may be unlimited, whereas the possible loss is fixed at the amount paid for the option. It differs from 'cover' (q.v.) in that the 'option money,' i.e. amount paid down per share for the option, is never re-

turnable. Arbitrage(q.v.).—Arbitrage business consists in buying in one exchange and selling in another. When the two deals take place, not between the London and a foreign exchange but between London and a provincial exchange, or between two provincial exchanges, the operation is known as 'shunting.

Carrying over and settlement .-Usually securities are bought or sold for delivery on the next settling day. Where, however, completion of the bargain is postponed to the next and investments ('for money').— bargain is postponed to the next speaks for itself; the term 'speculative' in connection with S. E. dealing requires explanation, and is not to be confounded with mere 'gaming.' A the absence of express agreement to 'speculative' deal, or time bargain, is the contrary. All 'carryings over,' or where the member (acting, of course, or confinations,' must be effected at for his ellent who sells has not the the making-up price at the then exist. for his client) who sells has not the the making-up price or the then exist-

average price between certain hours). Carrying over is effected on the first day of each settlement: this is called contango day.' On this day brokers arrange with jobbers to carry over to the next account, and therefore if a client does not wish to close or abandon his transaction, after paying or receiving the difference, he must before 11.15 A.M. on 'contango day' arrange for his broker to carry over. If he fail to do so, the broker can at once close the transaction at market price, and charge or pay his client the difference. The second day of the settlement is called 'ticket day,' or 'name day.' On or before this day a purchaser who intends taking up his securities issues a ticket stating that he is prepared to pay the purchase money. This ticket, which the broker passes on to the broker who sold the particular securities. contains, among other things, the name of the person to whom the purchaser desires the securities to be transferred and the price at which the With these bargain was effected. particulars the selling broker can make out a deed of transfer and deliver the securities. If, however, the party who was the ultimate pur-chaser's immediate seller does not intend to deliver because he in his turn bought from some one else, the ticket is passed on from hand to hand until it reaches the ultimate seller, who is the proper person to make out the deed of transfer. On the third day of the settlement, called 'settling day,' or 'pay day,' securities are taken up and paid for, or the differ-

appointment of a special settling day, and if the committee do not grant such day, the bargains made cannot be enforced.

Gaming and Wagering.—Prima facic all time bargains would seem to be mere gaming transactions, and therefore unenforceable. The essential difference is this: that in a gaming contract 'there is not only no intention on the part of either party to deliver or take delivery, but no obligation upon either to do so. There must be 'an agreement or understanding that all the buyer has to do is to receive from, or pay to, the seller the difference between the price of the bargains and the price at some future

ing market-price (i.e. the price ascertained by the clerk of the House two days before settling day to be the average price between certain hours. Carrying over is effected on the first day of each settlement: this is called contango day. On this day brokers mrange with jobbers to carry over to the next account, and therefore it client does not wish to close or bandon his transaction, after paying receiving the difference, he must

Ste family, such as the cod, haddock, hake, ling, and torsk, which are preserved by splitting open and dry-

structure of salt. Stockhausen, Julius (1826-1906), a vocalist, son of Franz S. (harpist and composer) and Madame S. (vocalist); studied at Strasburg (1844) and at Paris (1845-46) under Charles Hall for piano and Garcia for singing; be-

rmonio-direcian at Stuttof Stern's

(1874), and teacher in Frankfort Conservatorium (1882).

Stockholm, the cap. of Sweden, situated on the channel by which Lake Mülar discharges its waters into Lake Maiar discharges its waters into the Baltic, from which it is distant 36 m. The city is built partly on the continent and partly on nine islands formed by the said channel. The island of Stockholm, also known as Staden, was the site of the original town. It contains the Royal Palace, we distant of the built of the result of the said of an edifice of architectural merit, surrounded by beautiful gardens and adorned with a colossal statue of Gustavus Adolphus, which stands in front of the courtyard, and the cathedral, or church of St. Nicolai, where the kings of S. are crowned. The harbour is large and of great depth, and is capable of accommodating large vessels, but is blocked with ice during the winter. The islands connected with each are the mainland by handsome and bridges. include shipbuilding, engineering, brewing, tanning, and the manufacture of silk, tobacco, cork, and leather. The chief suburbs are

ostermalm, or being the edish navy, with an arsenal and extensive ship-

yards and depôts. Pop. 341,986.
Stockingford, a vil. of Warwickshire,
England, 1 m. W. of Nuncaton;
engaged in coal-mining and brickmaking. Pop. (1911) 5006.

Stockmar, Christian Frederick, Baron (1787-1863), was educated at the University of Jena, where he devoted himself particularly to the study of medicine. In 1814 he accompanied a Saxon regiment as chief most popular of these are: Tales out physician, and soon afterwards became one of the doctors of the hospital at Worms. S. about this time met Stein, and began to turn hisattention towards politics and diplomacy. He became the confidential adviser of Leopold I. of the Belgians. In 1836 he came to England to act as adviser to the young Princess Victoria, who succeeded to the throne in the following year. S. had for a while a good deal of influence at the English court.

Stockport, a municipal and parl. bor. of Cheshire, England, 6 m. S.E. of Manchester. The town itself is built on the edge of a ravine, with precipitous streets. Among its precipitous streets. Among los pleasure grounds, of which there are several, is Vernon Park, containing a museum. The chief manufs, include cotton goods, hats, machinery, and iron ware. Pop. (1911) 108,692.

Stocks (fruit). Many varieties of the larger kinds of fruit are found to be more producting when hydded or

more productive when budded or grafted upon the roots of other trees, e.g. the quince stock for pears, the apple for standard apples. Similarly, some varieties of roses make stronger growth and live longer when grown on the briar and other

stocks.

Stocks, a device for the punishment of certain criminal offenders which consisted of two baulks of timber so padlocked together as to imprison the feet and hands in holes made for the purpose. In Stow's Survey of London they were creeted in every ward of London for vagabonds and other potty offenders, while set up over the top of the prison in Cornhill, called the cage, was a pair of S. for the punishment of night walkers. See PILLORY.

Stocksbridge, a tn. in the W. Riding

of Yorkshire, England, 7 m. N.W. of Sheffield. It manufs. steel wire.

Shellicia. 10 manage.
Pop. (1911) 7090.
Stockton: 1. The cap. of San
Joaquin co., California, U.S.A., 70 m.
E.N.E. of San Francisco, on the Joaquin co., California, U.S.A., 10 m. E.N.E. of San Francisco, on the Atchison, Topeka, and Santa Fé Railroad. Its chief industries are the manuf. of agricultural implements, leather, woollen goods, lumber, and iron goods. Pop. (1910) 23,253. 2. A tn. of Gloucester co., New South Wales, 41 m. N.E. of Newcastle, engaged in shipbuilding. Pop. about 3000.

Stockton, Francis Richard (1834-1902), an American story writer, who established a type of story for children which won him great popularity in his own country. S. was engaged in jour-nalism for a while before he settled

of School; A Jolly Fellowship; Rudder Grange; The Lady or the Tiger; The Ting-a-ling Stories.

Stockton-on-Tees, a market tn., municipal and parl bor., and scaport of Durham, England, on the Tees, 5 m. from its mouth, and 18 m. S.S.E. of Durham. It has extensive docks, foundries, breweries, potteries, railway workshops, engineering works, blast furnaces, and glass bottle works. Canvas, ropes, huckaback, diapers, and checks are manufactured here. S. returns one member to parliament. Pop. (1911) 52,158.

Stockwell, a dist. situated in the bor. of Lambeth, S. London, and the site of Spurgeon's orphanage.

Stoddard, Richard Henry (1825-1903), an American poet, born at Hingham, Massachusetts. He began life as a blacksmith, but gave up trade for literature. Through the help of Hawthorne, he was employed in the Custom House from 1853-70. His poetical volumes include: Foot-His poetical volumes include: Foot-prints. 1849; Songs of Summer, 1857; The King's Bell, 1862; and Poems, 1880. He also wrote: Loves and Heroines of the Poets, 1861; Female Poets of America; a Life of Alexander von Humboldt, 1860; and Recollections, Personal and Literary, 1903, etc., and did much reviewing for New York papers.

Stoddart, Thomas Tod (1810-80), an angler and writer, was a native of Edinburgh. He eventually, however, moved his place of residence to Kelso. His chief works are: The Art of Angling, 1835; The Angler's Com-panion to the Rivers and Locks of Scotland, 1847, and also some poens. Stoics, the name for the sect of aucient moralists opposed to the

Epicureans in their views of human life. The Stoicul system dates from the end of the 4th century B.C.; it was derived from the system of the Cynics, whose founder, Antisthenes, was a disciple of Socrates. The doctrines, the manner of life, and the death of Socrates were the chief foundations of the Stoical philosophy. The founder of the system was Zeno, from Cittium in Cyprus, who derived his first impulse from Crates the Cynic. He opened his school in a building or porch, called the Ston Peccile ('Painted Porch') at Athens, whence the origin of the name of the sect. Zeno had for his disciple Cleanthes, from Assos in the Troad, whose Hymn to Jupiter is the only fragment of any length that has come down to us from the early S., and is a remarkable production, setting forth the unity of God, his omnipodown to serious authorship. There is forth the unity of God, his omnipo-a pleasant vein of mingled fancy and tence, and his moral government. sentiment about his tales. Among the Chrysippus, from Soli in Cilicia,

the first period of the system. period (200-50 B.C.) emsecond braces its general promulgation and its introduction to the Romans. Chrysippus was succeeded by Zeno of Sidon, and Diogenes of Babylon; then followed Antipater of Tarsus, who taught Panætius of Rhodes, who, again, taught Posidonius of Apamea, in Syria. It is remarked by Sir A. Grant that almost all the first S. were of Asiatic birth, and the system itself is undeniably more akin to the oriental mind than to the Greek. Posidonius was acquainted with Marius and Pompey, and taught Cicero, but the moral treatise of Cicero, De Officis, is derived from a work of Panætius. The third period of Stoicism is Roman. In this period we have Cato the Younger, who invited to his house the philosopher Athenodorus, and, under the empire, the three S. philosophers whose writings have come down to us —Seneca, Epictetus, who began life as a slave, and the Emperor Marcus Aurelius Antoninus. Stoicism prevailed widely in the Roman world, although not to the exclusion of Epicurean views. The leading Stoical doctrines are given in certain phrases or expressions, as 'Life according to Nature,' the ideal 'Wise Man,' Apathy' or equanimity of mind, the power of the 'Will,' the worship of 'Duty,' the constant 'Advance' in its or the power of the 'Will,' the worship of 'Duty,' the constant 'Advance' in the power of the 'Will,' the worship of 'Duty,' the constant 'Advance' in the power of the 'Will,' the worship of 'Duty,' the constant 'Advance' in the worship of 'Duty,' the constant 'Advance' in the worship of 'Duty,' the worship of virtue, etc. But perspicuity will be best gained by considering the Moral system under four heads—the Theology, the Psychology or theory of mind, the theory of the Good or human happiness, and the scheme of Virtue or Duty. (1) Their Theological doctrines comprehended their system of the Universe, and of man's position in it. They held that the Universe is governed by one good and wise God, together with inferior or subordinate deities. God exercises a moral government; under it the good are happy, while misfortunes happen to the wicked. According to Epictetus, God is the father of men; Antoninus exults in the beautiful arrangement of all things. They did not admit that the Deity intermeddled in the smaller minutiæ; they allowed that omens and oracles might be accepted as signs of the foreordained arrangement of God. They held this foreordination even to the length of fatalism, and made the same replies, as have been given in modern times, to the difficulty of reconciling it with Free-will, which in their system was unusually prominent. As to the existence of evil, they offered explanations such as the bilities are opposed to this higher following: God is the author of all Reason and Will, which, however, is

followed Cleanthes, and, in his things except wickedness; the very writings, defended and modified the nature of good supposes its contrast Stoical creed. These three represent evil, and the two are inseparable, like The light and dark; in the enormous extent of the Universe, some things must be neglected; when evil happens to the good, it is not as a punishment but as connected with a different dispensation; parts of the world may be presided over by evil demons; what we call evil may not be evil. Like most other ancient schools, the S. held God to be corporeal like man; Body is the only substance; nothing incorporeal could act on what is corporeal; the First Cause of all, God or Zous, is the primeval fire, emanating from which is the soul of man in the form of a warm ether. It is for human beings to recognise the Universe as governed by universal Law, and not only to raise their minds to the comprehension of it, but to enter into the views of the Creator, who must regard all interests equally; we are to be, as it were, in league with him, to merge self in the universal Order, to think only of that, and its welfare. As two is greater than one, the interests of the whole world are infinitely greater than the interests of any single being, and no one should be satisfied with a rega: than the who of view we are . above the consideration of the petty events befalling ourselves. The grand effort of human reason is thus to rise to the abin straction or totality of entire Nature. As to Immortality, the S. precluded themselves, by holding the theory of the absorption of the individual soul at death into the divine essence, but, on the other hand, their doctrine of advance and aspiration is what has in all times been the main natural argument for the immortality of the Divine power and government, they employed what has been called the argument from Design, which is as old as Socrates. (2) Next, as to the Constitution of the Mind. We have bodies like animals, but reason or intelligence like the gods. Animals have instinctive principles of action; man alone has a rational, intelligent soul. According to Antoninus we come into contact with Delty by our intellectual part, and our highest life is thus the divine life. But the most important Stoical doctrine respecting the nature of man is the recognition of Reason as a superior power or faculty that subordinates all the rest —the governing intelligence. This, however, is not a mere intellectual principle, but an active force, uniting intellect and will. The bodily sensi-

strong enough to control them. In for which was misspent labour-yet order to maintain their contrast with the Epicureans, the S. said that pleasure and pain are not principles of Nature. The doctrine called the Freedom of Will may be said to have originated with the S., although with them it was chiefly a rhetorical mode of expressing the dignity of the Wise of expressing the dighty of the visco Man and his power of rising superior to circumstances. (3) We must con-sider next the Stoical Theory of Happiness, or rather of the Good, which with them was not identified with happiness. They began by with happiness. They began by asserting that happiness is not necessary, and may be dispensed with, and that pain is no evil, which, however, if followed consistently, would dispense with all morality and four Cardinal Virtues (Wisdom, or the Knowledge of Good and Evil; Justice; Fortitude; Temperance) as part of their plan of the virtuous life, the life allowed the direct and ostensible pursuit of pleasure as an end (the point of view of Epicurus), but allured their plan of the virtuous life, the life social virtue, was placed above all the rest. But most interesting to us followers partly by promising them the victory over pain, and partly by are the indications of the idea of Benefic ast that grew out of their plan of life. Next to the discipline of the idea of Information to forgive a superficiency of the discipline of the idea of Information to forgive a superficiency of the idea of Information to forgive a superficiency of the idea of Information to forgive a superficiency of the idea of Information to forgive a superficiency of the idea of Information to forgive a superficiency of the idea of Information to forgive a superficiency of the idea of Information to forgive a superficiency of the idea of Information to forgive a superficiency of the idea of Information to the idea of I we must rank the complacent senti-ment of Pride, which the S. might justly feel in his conquest of himself, and in his lofty independence and superiority to the casualties of life. The pride of the Cynic, the S.'s predecessor, was prominent and offensive, showing itself in scurrility and contempt towards everybody else; the Stoical pride was a refinement upon stoical pride was a remement upon this, but was still a grateful senti-ment of superiority, which helped to make up for the surrender of in-dulgencies. The last and most ele-yated form of Stoical happiness was the satisfaction of contemplating the Universe and God. Epictetus says that we can discern the providence that rules the world if we possess two things—the power of seeing all that happens with respect to each thing, and a grateful disposition. The work of Antoninus is full of studies of of Antoninus is full or scuares.
Nature in the devout spirit of 'passing from Nature to Nature's God;' he is never weary of expressing his contentment with the course of natural events, and his sense of the beauties and fitness of every-thing. Old are has its mass, and doeth is the Stoica in their ideas of the Good, now described. The S. were the first to preach what is called 'Cosmopolitanism;' for although in their reference to the

good of the whole they confounded

they were thus enabled to reach the conception of the universal brotherhood of mankind, and could not but include in their regards the brute creation. They said: 'There is no difference between Greeks and Barbarians; the world is our city.' Seneca urges kindness to slaves, for 'are they not men like ourselves, breathing the same air, living and dying like ourselves?' The Epicureans declined, as much as possible, interference in while Africa but the Strigel, will public affairs, but the Stoical philo-sophers all urged men to the duties of active citizenship. Although there had been many good and noble men among the pagans, yet positive beneficence had not been preached as a virtue before the S. They adopted the virtue, and suggests considerations in aid of the practice of it; he contends as strongly as Butler and Hume for the existence of a principle of pure, that is, unselfish, benevolence in the mind, in other words, that we are made to advance each other's happiness. There is also in the Stoical system a recognition of duties to God, and of morality as based on piety. Not only are we all brethren, but also the 'children of one Father.' extraordinary stress put upon human nature by the full Stoic ideal of submerging self in the larger interests of being, led to various compromises. The rigid following out of the ideal issued in one of the Paradoxes, namely, that all the actions of the wise man are equally perfect, and that, short of the standard of perfection, all faults and vices are equal. This has a meaning only when we draw a line between spirituality and morality, and treat the last as worthless in comparison with the first. The later S., however, in their exhortations to special branches of duty, gave a positive value to practical virtue, irrespective of the ideal. The idea of Duty was of Stoical origin, fostered and developed by the Roman spirit and legislation. The Roman spirit and legislation. The early S. had two different words for the 'suitable' (kathekon) and the 'right' (katorthoma). It was a great point with the S. to be conscious of 'advance,' or improvement. By self-variation the least himself. examination he kept himself con-stantly acquainted with his moral state, and it was both his duty and together sentient life and inanimate objects-rocks, plants, etc., solicitude

the S. It is very illustrative of the unguarded points and contradictions of Stoicism, that contentment and apathy were not to permit grief even for the loss of friends. Seneca, on one occasion, admits that he was betrayed by human weakness on this point. The chief ancient authorities point. on the S. are the writings of Epictetus, Marcus Antoninus, and Seneca, themselves Stoical philosophers, together

Stoke Newington, a metropolitan bor. in the N. of London, with large reservoirs and waterworks. Pop. (1911) 50,659.

Stoke-on-Trent, a municipal, co., and parl. bor., and tn. of Stafford-shire, England, 141 m. N. of Stafford, on the Trent and Mersey Canal. The town is famous for its manuf. of pottery and porcelain, being in the centre of the potteries district. It is also engaged in coal mining and the manuf. of machinery and brickmaking. Hanley, Burslem, Fenton, Tunstall, Longton, and Stoke were included in the bor. of S.-on-T. in 1910. Pop. (1911) 234,553.

Stoke Poges, a vil. of Buckinghamshire, England, 2 m. N. of Slough. It is the burial place of Gray, the church-vard hains identified with the scene of Hanley, Burslem, Fenton,

yard being identified with the scene of

his Elegy.

Stokes, Sir George Gabriel (1819-1903), an Irish mathematician and physicist, born in Skreen, co. Sligo, and educated at Pembroke College, Cambridge, where he was appointed Lucasian professor of mathematics in He was secretary (1854-85), and president (1885-90) of the Royal Society, and fellow (1841-57), and master (1902) of his college. He represented Cambridge in parliament from 1886. See his collected Mathematical and Physical Papers, 1880-1905, and Memoir and Scientific Correspondence of G. G. Stokes, edited by Sir J. Larmor, 1907. Stokes, Whitley (1830-1909), a

British lawyer and Celtic philologist, born in Dublin, the son of William S. He became a barrister of the Inner Temple (1855), and in 1862 went to India where he became a member of the viceroy's council (1877), and president of the commission on Indian law (1879). He edited many Celtic texts and translated Lives of Saints from the Book of Lismore,

his satisfaction to be approaching to physician, born at Dublin. S. studied the ideal of the perfect man. When under Alison, and took the degree of the ideal of the periect man. When the property of the position of 'wise,' he M.D. in 1825. As hospital physician yet claimed to be advancing. This and instructor of students, S. according to the modern world. was unknown to the ancient before left some medical works which still retain their importance. Cambridge made him an LL.D.

Stokesley, a tn. in the N. Riding of Yorkshire, 9 m. S.E. of Stockton-on-Tees. Pop. (1911) 1600.

Stolberg, a tn. in the Rhine Province, Prussia, 61 m. to S.E. of Aixla-Chapelle. It manufs, glass, iron, and zine goods, and chemicals. Pop.

15,468. Stolberg, Christian Count (1748-1821), a poet, born at Hamburg. He studied at Göttingen, and became a member of that school of poetry of which Bürgerand Voss were members. After retiring from public service he went to live at Eckernförde until his death. He is the author of: Gedichte, 1779; Gedichte aus dem Griechischen, 1782; Schauspiele mit Chören, 1787; Vaterländische Gedichte, 1810, and a translation of Sophocles, 1787.

Stolberg, Friedrich Leopold, Count (1750-1819), a German poet and brother to Christian S. (q,v.), was a native of Bramstedt in Holstein. Among his works are: Geschiebted and Religion Versical Country (1980). Geschichle der Religion Jesu Christi, 1806-18; Gedichte, 1783; Die Jusci, 1788; and translations of the classics.

Stole, a vestment of the Catholic Church, worn by bishops, priests, and deacons in the administration of sacraments. It is a strip of silk, the colour varying according to the day, 2½ yds. long by 4 in. wide. It is worn by the pope, even when not officiat-ing, as a symbol of the Church's jurisdiction.

Stolen Goods. Possession of S. G. recently after their loss is prima facie evidence that the person in possession stole the goods or received them knowing them to have been stolen; but if many months have clapsed between the loss and the discovery the possessor cannot in the absence of any other circumstances implicating him with the theft be called upon to account for the manner in which he came by the goods. This, the doctrine of Recent Possession, is really no more than a statement of one kind of presumptive evidence, which may, according to the nature of the property stolen, the time that has clapsed, and so forth, amount either to eigent proof or no proof at all; e.g., if A, a known thief, be found in possession of a stolen horse some months after the theft, the fact of his possession in conjunction with his reputation hardly afford that degree of evidence of complicity that Stokes, William (1804-78), an Irish | the possession years after the theft of

would. Conviction on indictment for theft entails restitution of the S. G. to the But if the S. G. conrightful owner. sists of some valuable security or negotiable instrument (q.v.) which after the theft has been bond fide paid by some person who has rendered himself liable to discharge such security or instrument, the court will not order restitution (see also under MARKET OVERT). Goods obtained by fraud or other unlawful means not amounting to larceny (q.v.) and transferred to some bond fide purchaser will not be restored to the defrauded owner (Sale of Goods Act, 1893). Where S. G. have been sold by the thief to a bona fide purchaser the court has power to make an order, on the restitution of the goods to the owner, that out of any money found on the thief on his arrest a sum not exceeding the amount of the proceeds of the sale be paid over to the purchaser. Magistrates in the exercise of their summary jurisdiction also have have If S. G. power to order restitution. have been pawned, they will, generally speaking, only be ordered to be restored to the true owner if the amount lent by the pawnbroker was not over £10. (See also RECEIVING STOLEN GOODS and SEARCH WAR-RANTS.)

Stolp, a tn. in the prov. of Pomerania, Prussia, 68 m. N.W. of Danzig, having an ancient church and castle.

Pop. 33,768.

Stolypin, Peter Arkazhevich (1863-1911), a Russian statesman, the son of a Russian general, was born and educated at Baden-Baden and at the University of St. Petersburg. He was governor of the province of Saratoff and became Minister of the He Interior in the first Duma in 1906 and Premier in July of that year. He vigorously suppressed the revolutionary movement, at the same time representative preserving institu-A month or so after his tions. appointment an attempt was made upon his life, his villa being wrecked by a bomb. Although both he and Madame Stolypin escaped uninjured, two of his daughters and twenty other persons sustained serious injuries. Having obtained an imperial decree for the alteration of the franchise, he dissolved the second Duma. The third Duma had a large Centre party and was more amenable. He was shot during an interval of the performance at the theatre at Kieff and died two days

a diamond tiara worth about £100,000; end to the left, the narrower to the right, but still somewhat to the left of the median line. It is entered by the cosophagus by the cardiac orifice, where the circular muscle is thickened to form a sphincter. The opening of the S. into the intestine is called the pylorus. The innermost coat of the S. consists of mucous membrane made up of a layer of epithelial cells resting on connective tissue. When the organ is not fully distended, the mucous membrane is thrown into folds called rugae; when the S. is distended the rugae disappear. Outside the subrugae disappear. mucous coat of connective tissue are three coats of unstriped muscle, of which the inner is oblique, the next circular and the other longitudinal. The whole of the organ is embraced by the two layers of the peritoneum, the serous membrane which lines the interior of the abdominal cavity. The mucous coat contains gastric glands which secrete gastric juice and mucus. The food enters the S. by the cardiac orifice, and is then acted upon by the gastric juice which contains hydrochloricacid and an enzyme called pepsin. The juice is effectively mixed with the salivated food by the movements of the muscular walls of the S., the degree of distension of the sac being just sufficient to accommodate the contents. When the food is rendered acid by the action of the gastric juice and has been propelled by peristalsis to the pyloric canal, the pylorus opens to admit the food to the small intestine. The effect of digestion in the S. is to convert proteids into peptones. The gastric juice has also some bactericidal influence.

Gastrilis is inflammation of the coats of the S. Acute gastrilis may be set up by a corrosive poison, by the effects of acute fevers as typhus and diphtheria, or by unsuitable food. The flow of gastrio juice is arrested, digestion is stopped, and anti-peristalsis may occur, leading to vomiting. The attack tends to subside when the exciting cause is removed, and treatment should be directed to this end. In the case of poisoning, emetics should be used, but the administration of a purgative is less distressing when the irritating substance is indigested food material. Bismuth and restriction to a light diet are of help in soothing the irritated membrane. Chronic gastritis or gastric catarrh may follow from repeated acute attacks, and is especially associated with the alcoholic habit. The coats of the S. are in a state of chronic congestion, the mucous membrane and in some after.

Stomach, the pear-shaped digestive sac which in man is situated in the lis lessened and the patient becomes upper part of the abdomen, the wider a chronic dyspeptic.

Treatment

requires patience and perseverance tion of calcium chloride. in the subject. If alcohol is the pre- As a substitute

females of an anemic tendency. is caused by the S. digesting a part of its own tissue in which the bloodsupply is deficient. The ulcer or ulcers usually occur toward the pyloric end, are small and circumscribed, but may tend to eat right through the S. wall, when a fatal ending can hardly be averted. The most characteristic averted. symptoms are severe pain and vomiting immediately after food. The best treatment is absolute rest combined with a milk diet, when the condition may cure itself. Copious hemorrhage indicating the danger of perforation at an early period, should be met by prompt surgical measures. If perprompt surgical measures. If perforation has taken place, immediate suturing of the opening and cleansing of the abdominal cavity may lead to recovery.

Cancer of the stomach may follow chronic gastric ulcer and usually occurs at the pyloric end. symptoms are somewhat indefinite. Discomfort is felt some hours after taking food and vomiting of large masses occasionally occurs. Unfortunately, the condition is generally recognised too late surgical for measures to be of any avail.

Stomach-pump, a pump for withdrawing the contents of the stomach. It is used in cases of poisoning, especially by narcotics. Where there especially by narcotics. Where there has been any lesion of the coat of the stomach, as by a corrosive poison, its use is detrimental.

Stomata, the minute openings in the epidermis of the leaves of plants by means of which the plant tissues are in communication with the external atmosphere allowing the absorption or emission of gases and of aqueous vapour. They open in the light and close in darkness. They are most numerous on the under surfaces of leaves, but occur on all parts

of plants above ground. Stone, in medicine, see CALCULUS,

SONRY). preserving S. from the ravages of the Reyser. In 1619 he was appointed atmosphere is of vital importance. atmosphere is of vital importance. For sandstones a coating of boiled linseed oil or oil paint is employed. Ransome suggested a coating of alkaline silicates followed by applica-

Artificial: for natural disposing cause, it should be aban artificially made bricks of burnt clay, doned, and the diet should be care or terra-cotta blocks, are largely fully restricted for a protracted used. Ransome's artificial S. is made fully restricted for a protracted period. Bismuth and arsenic are used to all allaying irritation, and peptonised foods help to supply the deficiency in the glands.

Gastric ulcer is commonest in Calcium chloride solution. Calcium chloride solution. Calcium chloride solution. calcium chloride solution. Calcium silicate is formed and compacts the mass. Portland cement is also used for artificial S. See Concrete.

Stone, a standard British weight, called the imperial S., is 14 lbs. Other Ss. in use are 8 lbs. for meat, 24 lbs. for wool, 16 lbs. for cheese, 5 lbs. for class and 32 lbs. for heese, 5 lbs. for class and 32 lbs. for beautiful for hem?

glass, and 32 lbs. for hemp,

Stone: 1. A tn. of Staffordshire. England, on the Trent, 7 m. N. of Stafford. It is an old town and is engaged in shoemaking and brewing. Pop. (1911) 5690. 2. A vil. of Kent. England, 4 m. W. of Gravesend, on

the Thames. Pop. (1911) 5100.

Stone, Edmund (d. 1768), a celebrated Scottish mathematician. He found a benefactor in the Duke of dargyle, to whom his father was gardener, and was thus enabled to pursue his favourite studies. In 1723 he published a work on The Construction and Principal Uses of Mathematical Instruments, followed by A New Mathematical Dictionary and The Method of Fluxions. In 1725 was admitted a follow of the Royal Society. Society.

Stone, Edward James (1831-97), an astronomer and fellow of the Royal Society and president of the Astronomical Society (1882-84). S. held the appointment of chief assistant of the Greenwich Observatory, and later in life took up the post of astronomerroyal at the Cape of Good Hope. He published a set of Tables for Facilitating the Computation of Star-constants. Stone, Marcus (b. 1840), a painter of subjects of human interest. He has

become known as the inventor of a type of illustration characterised by prettiness and a rather facile grace. Most of his work has been reproduced in one form or another. He was made an A.R.A. in 1877, and was elected to membership of the Royal Academy in 1887, where his work is usually exhibited. He has received medals from many international exhibitions. Stone, Nicolas (1586-1647), born at Woodsbury, near Exeter. He lived three years in London with one Isaac

GALISTONES, LITHOTOMY.
Stone (for the chief types of S. used in architecture, see Building Stones, For dressing S., see Massones).

For dressing S., see Massones, where he worked for Peter de Bounds.

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· nall; and or-mason o several Abber: among them one to Spenser. S. had the modern Eskimo. three sons, Henry, Nicholas, and John. *Henry Stone (d.* 1653) was a statuary and painter. He studied in Italy and the Netherlands, and made many excellent copies of celebrated Italian and Flemish pictures. There is a large copy at Hampton Court of the celebrated picture, by Titian, of the Cornaro family, now in the pos-session of the Duke of Northumberland. Nicholas Stone (d. 1647), the second son, who was a statuary, also studied abroad, and modelled many excellent copies of celebrated works. Stone, Samuel (1602-63), an English Puritan divine, born in Hertford.

With Thomas Hooker he settled in New England (1633) and was ap-pointed teacher at Newtown (Cambridge). In 1636 they removed to Hartford in Connecticut. S. published A Congregational Church, a

issed A Congregational Church, a Catholic Visible Church in 1652.

Stone Age. The history of man's gradual advancement in civilisation has been divided by archeologists into three ages: (1) Stone Age, (2) Bronze Age, (3) Iron Age. The S. A., in which man used implements of stone has been divided into (2) The of stone, has been divided into (a) The Older S. A. or Palæolithic, and (b) The Newer S. A. or Neolithic. The men of the Palæolithic Age were hunters, and the remains of successive hunting races have been found in the deposits of caves, river gravels, and other sedi-ments. This Paleolithic series has been divided into Upper, Lower, and Middle groups, and the groups further subdivided into stages thus:—

Unner	, Magdalenian	Stage
Upper Palæolithic	Solutrian Aurignacian	,,
		**
Middle	Mousterian	,,
Lower	Acheulian Chellean	,,
	Chellean	,,
	Strepyan Mesvinian	71
	` Mesvinian	,,

Palæolithic men were nomadic, followers of the chase, and they used implements of rough unpolished stone. These earlier flaked stone implements are found in terrestrial or fluviatile deposits, and occur in association with relies of northern (mammoth, reinder, area beat and the control of the contro reindeer, cave-bear) and southern mammalia (lion, leopard, hippopotamus). The dwellings of Palæolithic these caves are covered with rough sketches of animals belonging to that period. Some of these sketches are painted in tints of red and brown, e.g. the cave at Font-de-Gaume near Eyzles in Dordogne. The men who inhabited the caves of Europe in There is a secure harbour, and dis-

The Neolithic implements occur in river-terraces. alluvial deposits, lake dwellings, and in a few caves in layers above the Palæolithic relics. That Neolithic man was more cultured than the Paleolithic is shown by the fact that his weapons and tools were made of highly polished stone. With the relics of Neolithic man are found remains of animals which show that typical glacial fauna had died out. The woolly rhinoceros and mammoth had become extinct. Remains of the Irish elk, the reindeer, beaver, brown bear, etc., are abundant. Besides these wild animals, the remains of domesti-Besides these cated forms such as the cat, horse, sheep, dog, and goat, all of which were not part of the indigenous fauna of Europe, point to the fact that Neolithic man was not nomadic as the Palcolithic man. The tribes were acquainted with agriculture, and were advanced in the arts of weaving and pottery-making. Against the classification of the S. A., according to the nature of its weapons, into an earlier flaked and a later polished S. A., it has been argued that the division should be arranged according to the most fundamental differences into a hunting and an agricultural stage. See Solla, Ancient Hunters, 1911; Boyd Dawkins, Early Man in Britain, 1880; Sir John Lubbock, Prehistoric Times, 1865, etc., etc. See also Archeology, Bronze Age, and IRON AGE.

Stone-chat, or Praticola rubicola, a small bird of the family Turdide. The male bird has a black head and throat, dark back, and tawny breast. and the female differs from it in that its head is brown. It is frequently seen in Britain.

Stone Circles. CIRCLES OF seeSTONE.

Stone Coal, see ANTHRACITE. Stone-crop, see SEDUM.

Stonefield, a tn. of Lanarkshire, Scotland, situated to the S.E. of Glasgow. Pop. (1911) 7300.

Stone-fly, a name given to any of the orthopterous insects of the order Plecoptera. The species are of wide distribution and frequent running streams. The larvæ are deposited in water and are usually found under stones.

Stoneham, a tp. in Middlesex co. Massachusetts, U.S.A., 9 m. N. of men were caves, and the walls of Boston. Its chief manufs, are boots. automobiles, and chemicals. (1910) 7090.

Paleolithic time were very similar to tilleries and tanneries. The ruins of

Pop. (1911) 4266.

Stonehenge (Saxon Stanhengist. hanging stones), a circular group of tremendous standing stones on Salisbury Plain, 2 m. from Ames-bury in Wiltshire, England. It is situated among a series of prehistoric barrows of the Bronze Age, and is probably only a small portion of its nclosed with-

300ft. in dia-N.E. end by uter circle of

trilithons, 100 ft. in diameter, com-posed of 'sarsens,' or monoliths, of Tertiary sandstone, originally thirty in number, and set up at regular distances of about 4 ft. Concentric with this circle, 9 ft. inwards, is a second circle formed of 'blue stones,' or undressed boulders of primitive rock, originally forty in number and irregular in shape and height. Within are two ellipses, the outer one, nearly of horse-shoe form, containing five trilithons, formed by ten sarsens, the inner one, smaller and of the same shape, being made up of blue stones, originally nineteen in number. Near its central curve lies the 'Altar Stone, 15 ft. long and over 4 ft. wide. To the N.E., standing outside the circle, is a huge monolith, the so-called 'Friar's Heel.' The open part of the horseshoe is on a line with this stone, almost facing the sun-rise. This fact has been advanced to support a theory that S. was a temple for sun-worship, and Sir Norman Lockyer has shown in Stonehenge and other British Stone Monuments (1906) that, taking into account astronomical taking into account astronomical causes, the sun rose exactly above that spot in 1680 B.C., the possible date of erection. Other theories regarding its origin are: That it was a monument to the 400 nobles slain by Hengest (472); that it was moved from Ireland by Merlin; and that it was a burial place of Boadicea. As a temple it has been ascribed to the temple it has been ascribed to the Romans, Druids, Phœnicians, Saxons, and Danes. Excavations were made in 1901, and stone tools, coins, bones, and fragments of pottery were found. The following is a person active more appropriate to appropriate to a person active more appropriate to approp

Dunnottar Castle are in the vicinity, in London, and in 1857 became the Pop. (1911) 4266. editor of The Field. He has published numerous works on sport, among them: The Greyhound, 1853; British Rural Sports, 1856; The Dogs of the British Islands, 1867.

Stonehouse: 1. Or East S., a tn. in Devonshire, England, situated between Bourneyer and Blycomethers.

tween Devonport and Plymouth, with which it forms the 'Three Towns.' Pop. (1911) 13,754. 2. A vil. of Gloucestershire, England, 3 m. W. of Stroud; engaged in the woollen manuf. Pop. (1911) 2200. 3. A tn. of Lanarkshire, Scotland, 7 m. S.E. of Hamilton, on Avon Water. Pop. (1911) 3688.

Tennessee, U.S.A.; Stone River, on it stands Murfreesboro, near the site of an indecisive battle between the Federal army, under Rosecrans, and the Confederates under Bragg,

in 1862 and 1863. Stones, Precious. The subject of P. S. in relation to jewellery having been dealt with in the article GEM, the purpose of this article is supplementary, viz. to give a few facts and fancies with regard to the stones per se. From time immemorial cerper se. From time immemorial certain stones have been thought, in some subtle way, to have a connection with the influence of the planets: in other words, the alchemist joined hands with the astrologer. following list, which is taken from the interesting little brochure issued by Messrs. C. Calipé, 43 Poland Street, London, W., gives a list of stones in relation to the Signs of the Stones in relation to the Signs of the Zodiac and to the Planets, in the latter case the metals being added. The Zodiac: Arles, ruby; Taurus, topaz; Gemini, carbuncle; Cancer, emerald; Leo, sapphiro; Virgo, diamond; Libra, Jacinth; Scorpio, agate; Sagittarius, amethyst; Capricornus, beryl; Aquarius, onyx; Pisces, jasper. The Planets: Saturn, turquoise and lead: Jupiter, carpollan and tin: Mars. lead; Jupiter, carnelian and tin; Mars, emerald and iron; Venus, amethyst and copper; Mercury, loadstone and quicksilver; Moon, crystal and silver; Sun, diamond and gold. pleasing fancy is that certain stones

, crysolite; October, opal; No-Stonehenge, the nom de plume of vember, topaz; December, tirquolse. John Henry Walsh (1810-88), an English author, born in London. He obtained his qualifications as a of the ancient Hebrews are well surgeon and had practices in London known: 1st, sardius; 2nd, topaz: and Worcester until 1852. In that 3rd, carbuncle: 4th, emerald; 5th. year, however, he fixed his residence sapphire; 6th, diamond; 7th, jacinth:

8th, agate; 9th, amethyst; 10th, cry- the curriculum including classics an solite, 11th, onyx; 12th, jasper; but the sciences. that tradition has assigned a precious stone to each of the Twelve Apostles is not generally known. They are as follows: Simon Peter, jasper; Andrew, sapphire; James, carbuncle; John, emerald; Philip, sardonyx; Bartholo-Thomas, bervl: sardius ; Matthew, crysolite; James the Younger, topaz; Jude, crysoprase; Simon, jacinth, Matthias, amethyst. crysolite; the Leaving fancy and turning to scientific fact we find that the diamond is the hardest stone and that the little known zircon has the greatest specific A list of the relative gravity. hardness and of the relative specific gravity of some of the chief stones is: Hardness: Diamond, 10; corundum (ruby, sapphire, etc.), 9; chrysoberyl, 8½; topaz, spinel, 8; beryl, emerald, aquamarine, 7½; zircon or jargoon, 7½; garnet (red), tourmaline, 7½; quartz, crystal, amethyst, jasper, crysoprase, 7; chalcedony, carnelian, 6½; turquoise, 6; opal, 5½-6½; jet, 3½; amber, 2½. Specific gravity; Jargoon or zircon, 47; garnet, 42; ruby and sapphire, 40; alexandrice, chrysolystal crysony spins! chrysoberyl, cat's-eye, spinel, 3·6; diamond, 3·52; topaz, crysolite, and peridot, 3·4; tourmaline, 3·0; turquoise and emerald, 2·7; amethyst, 2·6; moonstone, 2·39; opal, 2·21. See Gem.

Stonewall ' Jackson, see JACKSON,

THOMAS JONATHAN.

Stoneware, see POTTERY.

Stone Worship, see FETISHISM, and

IDOLATRY.

Stonhouse, Sir James (1716-95), an English physician and divine, studied at St. John's, Oxford, and at St. Thomas's Hospital, London. He founded a county infirmary at He founded a county infirmary at Northampton, where he practised from 1743-63. Taking holy orders in 1749, he was appointed to the rectory of Little Cheverell (1764) and Great Cheverell (1779), and subsequently preached in Bath and Bristol. He published many religious tracts, and also Everyman's Assistant and the Sick Man's Friend, 1788.

Stonington, a popular wateringplace of Connecticut, U.S.A., in New London co., situated on Long Island Sound, 40 m. S.W. of Providence. Pop. (1910) 9154.

Stonyhurst, a Roman Catholic College, 4 m. S.W. of Clitheroe in Lancashire, England. It had its origin in the College of S. Omer, founded in France in 1592. The members of the latter took refuge in Bruges and in Llège during the 18th century, after the suppression of the college in France, and eventually were offered a place at S. by Mr. Weld. There are about 300 students,

Stony Stratford, a tn. of Buckinghamshire, England, on Watling Street and the R. Ouse, 7 m. N.E. of

Buckingham. It has engineering works. Pop. (1911) 2500. Stool-ball, an English game, extremely popular between the 15th and 18th centuries. It was played by two people, the aim of the one being to strike the stool with the ball, and that of the other, who placed himself in front of the stool, to prevent his opponent's so doing. See Strutt, opponent's so doing. See Strutt, Sports and Pastimes of the People of England, 1903.

Stool of Repentance was either a seat or pew in churches in Scotland, in which persons who had come under the censure of the ecclesiastical authorities for some sin, such as drunkenness or lying, were made to

stand.

Stools, the evacuations from the bowels. Normally they consist of un-digested food, digestive juices not absorbed, fragments of epithelium, etc. In disease of the alimentary canal they often give valuable diagnostic indications, through the presence of blood, mucus, casts, parasites, bacteria, etc. Constriction of the bacteria, etc. Constriction of the intestine is sometimes shown by small round masses, called sheep-dung S. Lead-pencil S., or faces of small diameter, are not necessarily indicative of intestinal stricture.

Stopford, Sir Robert (1768-1847), an English admiral, seized a number of French privateers in the Bay of Biscay (1799), and in 1802 was supervising the execution of the Peace of Amiens in the W. Indies. He received a gold medal for the part he played in the battle of San Domingo (1806). In 1840, with Napier's assistance, he seized Sidon and Beyrout, and successfully stormed Acre, thus relieving the sultan of all danger from Mehemet Ali.

Stop-order. The effect of obtaining a S. on a fund in court is to stop the payment out to any person other than he who has obtained the

Ordinarily the assignee of chose in action (q.v.) must give notice (see NOTICE) to the legal holder in order to perfect his title as against third persons who may have charges on the same property; but when the chose in action is in court a S. is

required in lieu of a notice.

Stoppage in Transitu, the right conferred on the unpaid vendor of goods who has parted with the goods to stop them on the insolvency of the buyer, before they have reached the latter's actual or constructive possession, and to resume possession until they are paid for. S. in T.

it can be exercised only when the in a bottle of water. buyer is insolvent and only when the goods have left the possession of the The effect of S. in T. is not to rescind the sale, and, indeed, the buyer can recover damages if the vendor re-sells when he ought not. But in some cases the vendor may at once resell against the buyer. (1) Where the goods are perishable. (2) Where the right of re-sale was expressly reserved in the contract of sale. Apart from these cases the seller must give notice of his intention to resell, and also give the buyer a reasonable opportunity to pay or tender (q.v.) the price.

Storace, Stephen (1763-96), a violinist and composer, studied at Naples; as a boy-prodigy he could play the most difficult works of Tartini. After touring Italy he reached Vienna, where he produced two operas, Gli Sposi malcontenti (1785), and Gli Equivoct (1786), and some chamber-music, incidentally meeting Mozart. He returned to England in 1787, and produced with the greatest success the operas, The Haunted Tower, 1789; The Siege of Belgrade, 1791; and The Pirates, 1792, his finest achievement.

Storage Batteries, see ACCUMULA-TORS.

Stora Tuna, a com. 13 m. by rail N.W. of Bispberg, in the prov. of

Kopparberg, Sweden. Pop. 19,453. Store (late Lat. staurum, a supply, etc.), a stock or supply of any commodity or commodities kept either for a specific purpose, for ordinary use, or for an emergency. In military language stores mean ammunition, arms, accoutrements, etc., and various special kinds of stores which are required by the Royal Engineers, the Royal Artillery, the Royal Army Medical Corps, and the Army Veterinary Corps. The ordinary stores at supplied by the Army Ordnance Department, over which is the quarte reactor graph. master-general. The word store used in America for the 'genera utility' shop of the more outlyin districts, and for a shop in general of (dry goods store, etc.), whilst 'stores' in England are huge establishments in themselves even which combine in themselves every variety of retail shops.

Storing Fruit. Late apples and pears can be kept in good condition for several months if perfectly healthy, sound, and dry. For the purpose, a cool, ventilated, but frost-proof store-room is necessary. The fruits should be corrected out or sleep heards of the be spread out on clean boards so as not to touch each other. Pears need a rather drier and warmer atmosphere than apples. Grapes, if free from mildew, can be kept for a long time if the

differs from lien (q.v.) in two respects: | lateral stem attached and this placed

Stork (Ciconia), a genus of wading birds with long conical bills, long ormerly plentiful in Britain, but is now only an occasional visitor. It is widely distributed on the continent, in many parts of which it is strictly protected for its service in destroying reptiles, small mammals, and insects, and in devouring offal. Its great clumsy nest is often to be seen on a house top or church spire. Its plumage is greyish white, its quills and longest feathers on the wing coverts black, and the beak and legs red. The black S. (C. nigra) has the upper surface black and the lower parts white. This species also is protected, and, during migration, occasionally strays Britain.

Stork, Abraham (d. 1708), a Dutch marine and landscape painter, born at Amsterdam. His sea-views are particularly bold and spirited, and there is a picture by him of the old harbour, Rotterdam, in the Rotterdam Gallery.

Storm, an atmospherical disturb-ance in which the wind attains a velocity up to about 40 m. per hour. Various forms of these disturbances are manifest. In some regions sudden

The eddy type of S. has Ocean. received most attention; these Ss. are known under various local names, e.g. hurricanes, typhoons. The general name proposed is cyclones (q.v.) owing to the supposed circular motion of the wind. The wind, however, has more probably a spiral motion, incurring towards the centre. One of the com-

wind Correo the The i area

low barometric pressure. See CYCLONES, .

TYPHOONS, Storm, Gu wegian hist-

Chief amon Cucle of D Didrik Bern; Studies on Travels in Finland; The Saga of Eril: the Red; Monumenta historica Nor-vegia; Regesta diplomatica Norvegia;

regia, etc. " - - - - - 117-14-am /1217-221

bunches are cut with a few inches of the service of Schleswig-Holstein and

Prussia. lyric poet by his Gedichte (12th ed., 1900), and his first novel was Immensee (51st ed., 1901) which gained him general recognition, and was followed by numerous other short stories, including: Psyche; Hans und Heinz Kirsch; Der Schimmelreiler, etc. See Lives by Schütze, 1887, and

P. Remer, 1897.
Storm Warnings, see WEATHER FORECAST.

Stornoway (Stjarna's Vagr or Bay), a scaport and police burgh of Lewis Is. (E. coast), Outer Hebrides, Rossshire, Scotland, on S. Harbour, 180 m. N.W. of Oban. Its castle was completed in 1870. It is the chief town in the Western Isles, and an important fishing centre (especially for herrings). Pop. (1911) 3810 (nearly trebled in the fishing season). See Black's Princess of Thule.

Storthing (Danish, high court), the national parliament of Norway, the representatives of which are elected triennially. The S. is convened every year, and is divided into a Lagthing or Upper House, composed of onefourth of the members, and a Odelsthing or Lower House, composed of

the remainder.

Story, Joseph (1779 - 1845), an American jurist, born at Marblehead in Massachusetts, U.S.A. He entered Harvard University in 1795, and in 1801 was called to the bar, and speedily obtained extensive practice. In 1805 he became a member of the legislature of Massachusetts, and he continued a representative till he was made a judge. In 1811 he was appointed an associate justice of the Supreme Court of the U.S.A. The result of his practical experience was his Commentaries on the Con-flicts of Laws (1834), which gained him a reputation in Europe. In 1830 he was appointed to the newlyfounded chair of jurisprindence in Harvard University; and during the time that he held this professorship he wrote his numerous legal treatises On the Law of Agency, On the Law of Partnership, On the Law of Bills of Exchange, On the Law of Bailments, On Equity Jurisprudence, and On Equity Pleading. Story, Robert Herbert (1835-1907),

a Scottish theologian, born at Roseneath, Argyllshire, and educated in Edinburgh, Heidelberg, and St. Andrews. Ordained in 1859, and appointed to the parish of Roseneath the next year, on his father's death. In 1886 he became professor of eccleslastical history in Glasgow University. His numerous publications

First became known as a he is editor of a work on the Church of Scotland, Past and Present, 1890-91. Story, William Wetmore (1819-95).

American sculptor, poet, and author, born at Salem, Massachusetts. He executed numerous monuments, statues, and busts, amongst them being 'Cleopatra' and the 'Libyan Sibyl' in the London Exhibition (1862), and the 'Peabody' statue in front of the Royal Exchange, London. His publications include: The American Question; Roba di Roma; Nero; He and She; Poems (1885), etc. See Life by H. James (1903).

Stothard, Charles Alfred (1786-1821), 1821), an ingenious antiquarian draughtsman, born in London, son or augustsman, norm in London, son of Thomas S. After studying successively at the Royal Academy, Life Academy, and at the British Institute, Pall Mall, he began in 1810 his first historical piece, 'The Death of Richard II. in Pomfret Castle,' and the following year he was induced to a sublish the fort part of a rabble publish the first part of a valuable work on The Monumental Effigies of In 1815 S. was ap-Great Britain. pointed historical draughtsman to the Society of Antiquities, and was deputed by that body to make drawings from the Bayeux tapestry. 1819 he laid before the society a complete series of the drawings from the Bayeux tapestry, and the same year was elected a fellow. In 1821 he went to Beer-Ferrers, Devonshire, and to Beer-Ferrers, Devonshire, and while tracing the portrait of Sir William Ferrers in the E. window of the church, he fell from a height of 10 ft. and was killed. His widow and her brother completed his Monu-mental Efficies, which he left un-finished. His biography was written by his widow, afterwards Mrs. Bray, a popular writer of novels and books of travel.

Stothard, Thomas (1755-1834), an English artist, born in London. entered the Royal Academy schools in 1777, and began to exhibit his pictures in the following year. He was elected an academician in 1794. It is, however, as an illustrator that he is best known and most highly appreciated. He illustrated the novels of Richardson, Fielding, Smollett, and Sterne, as well as such standard works as Robinson Crusoe, Gil Blas.

and Tristram Shandy.

Stoughton, a tn. of Norfolk co., Massachusetts, U.S.A., 18 m. W. of Boston. Manufs. include cardigan jackets, boots, shoes, and rubber. jackets, boots, s Pop. (1910) 6315.

Stoughton, John (1807-97), an Eng-Nonconformist minister and lish historian, born in Norwich. He was a student at Highbury College, and was ordained in 1833. In 1872 he include: Creed and Conduct: Health a student at Highbury College, and Haunts of the Riviera; William Carwas ordained in 1833. In 1872 he stares; Nuga Ecclesiasticae, etc., and became professor of theology in New Hundred: Vears Ago. 1862; Eccle-Library.

siastical History of England, 1867; Stowe, Harriet Elizabeth Beecher (1812-96), an American povelist and Life, 1895.

Stour, the name of three English rivers: 1. The boundary between Suffolk and Essex; it flows into the estuary of the Orwell at Harwich. It is navigable to Sudbury. Length 47 m. 2. The Great S., rises near Lenham, Kent, and flowing past Ashford, Canterbury, and Sandwich, it enters Pegwell Bay. Length 40 m. It has two tributaries, East S. and Little S. 3. A trib. of the Hampshire Avon, rises in Wiltshire, and flowing through Dorsetshire and Hampshire the Avon at Christchurch. Length 55 m.

Stourbridge, a market tn. of Wor-Stourbridge, a market th. of Worcestershire, England, in the Droit-wich parl. div., 4½ m. S. by W. of Dudley. It has a town hall (1887), an Edward VI. grammar school (1552), which Dr. Johnson attended (1726-27), a blue coat school (1667), and glass manufactures, established by Hungarian emigrants about 1556. Other manufs. include earthenware, rails chains parchment, leather, etc. nails, chains, parchment, leather, etc. Pop. (1911) 17,316.

Stourbridge Fair, see FAIR.

Stourport, a tn. in the co. of Worcester, England, seated at the junction of the Severn and Stour, here crossed by a handsome bridge, 4 m. S. of Kidderminster. lt is a centre of inland navigation, with iron, carpet, and tanning industries. Pop. (1911) 4432.

Stout, an alcoholic beverage, greatly consumed in England, concocted from a brew of ordinary and burnt malt, with caramel and malt substitutes added. Alcohol, carbohydrates, organic acids, and water are the principal constituents of the finished product. There are several varieties of S., such as oatmeal, invalid, etc. In neuralgic troubles the drinking of

S. is often very beneficial.
Stouthrief, in Scots law, an obsolete term used to denote the crime of despoiling a house with violence to

the inmates.

Stovaine, see ANÆSTHESIA. Stove, see HEATING.

Stove Houses, see HOTHOUSE.

Stove Houses, see Hornouse. Stove Houses, see Hornouse. Stove, a par. of Midlothian, Scotnd, on the Gala Water, 4; m. 7.S.W. of Lauder. It has woollen

College, St. John's Wood. His works Survey of London has more than once include: Church and State Two been reprinted (see Everyman's

philanthropist, born at Litchfield in Connecticut, U.S.A. Her father, Lyman Beecher, was president of the Lane Theological Seminary at Cin-Lane Theological Seminary at Cincinnati, and in 1836 Harriet married one of the professors, Calvin Ellis S. Her first publication was The Mayflower (1843). Uncle Tom's Cabin appeared in The National Era, in serial form, in 1850, and on its publication as a book two years interesting an almost warningled. later attained an almost unexampled popularity. Half a million copies were sold in the United States and it was translated into twentytwo foreign languages. Feeling that she had a message to deliver, she visited England in 1853 to lecture on the slavery question. Her succeeding novels were: Dred: a Tale of the Dismal Swamp, 1856; The Minister's Wooing, 1859; and Old Town Folks, 1869. See Lives by C. E. and L. B. Stowe and Annie Fields (1899).

Stowell, Lord, see Scott, WILLIAM. Stowmarket, a market tn. of Suffolk, England, on the Gipping, 121 m. N.W. of Ipswich. It manufs. iron, bricks, agricultural implements, gun-cotton, automobiles, etc. Pop. (1911) 4230. See Hollingsworth's History of Stowmarket, 1844.

Stow-on-the-Wold, a market tn. of

Gloucestershire, England, 15 m. N.E. of Cheltenham. Pop. (1911) 1301.
Strabane, a tn. in co. Tyrone, Ireland, on the R. Mourne, 13 m. S.W. of Londonderry. It has numerous orchards and market gardens, while large quantities of grain are exported. Shirt making is the chief industry. Pop. (1911) 5107.

Strabismus, see SQUINTING. Strabo (c. 63 B.C.-25 A.D.), a Greek geographer and historian, born at Amasia in Pontus. He travelled extensively in Greece, Italy, Egypt, Sardinia, and Ethiopia. His historical memoirs remain only in fragments, but his Geographica, the most important work of antiquity on that science, is extant, almost complete, in seventeen books. The chief editions are: Aldine (Venice, 1516), Casaubon (1587), Muller (1853), Meineke (1866-77), and Tozer (Oxford, 1893).

Stow, a part of the Gala Water, 4 m. M.S.W. of Lauder. It has woollen mills. Pop. (1911) 1317.

Stow, John (1525-1605), an English newspaper proprietor and man of letters, was the second son of Sir Edward S. He edited the Cornlish antiquary, born in London, is best remembered by his Survey of best remembered by his Survey of London (1558). He edited Chaucer's publications include: From Grave to Works (1561) and published the Chronicles of Matthew Paris (1571) Bible, 1908; and A New Way of Life, and Thomas Walsingham (1574). His Strachey, John St. Loe (b. 1860),

Strachey, Sir John (1823-1907), an manufs. are cotton and woollen Indian administrator, brother of Sir goods. Pop. 6154.
Richard S., born in London. Entered Strafford, Thomas Wentworth, first Indian administrator, brother of Sir Richard S., born in London. Entered the Bengal civil service in 1842, and on the assassination of Lord Mayo in 1872, acted as viceroy of India. Two years later he was appointed governor of the North-West Pro-vinces. Published India, its Administration and Progress, and Hastings and the Robilla War.
Strachey, Sir Richard (1817-1908),

an Indian soldier of distinction, who served in

46, and .. the Mut!

Jesuit priest, professor of rhetoric at the Gregorian College in Rome. He is chiefly remembered for his history of the revolt of the Netherlands against Spain, entitled De Bello Belgico ab Excessu Caroli V. ad annum 1590. He also published Prolusiones, essays on classical literature. All his writings

are in Latin. Strada (or Stradanus), John (1536-1604), a noted Flemish painter, born at Bruges; excelled as a painter of animals, hunting scenes, etc. One of his best known pictures is the 'Crucifixion' in the Church of the Annunciation at Bruges.

Stradbally, a tn. of Queen's co., Ireland, 61 m. E. of Maryborough. Pop. (1911) 950.

Stradella, Alessandro (c. 1645-c. 1681), a composer of operas and church music, born at Naples. Little is known of him except that he was cluding S. Giovanni Battista (published 1676), and a quantity of cantatas and madrigals.

Stradivari, Antonio (1644-1737), the perfecter of the violin, associated with Cremona. He was an apprentice under Nicolo Amati, and until 1684 devoted himself chiefly to small models in the Amati style. The period 1684-90 was one of transi-The period 1684-90 was one of transity piec. Height 10,355 10, tion; in 1690 he began making to long Strads, and finally, after mutual action of the particles of a 1700, he discarded the Amati style body. As every action is accompanied pursued original lines. Some panied by a reaction, all forces are famous 'Strads' are the Boissier stresses. The change of form due to (formerly owned by Sarasate) and a stress is called a strain. A longitudinal stress, in which the forces are piece. He is famous also as a maker of rights and rights are stress.

Earl of (1593 - 1641), an English statesman, born in Chancery Lane, London, and educated at St. John's College, Cambridge. In 1611 he married Lady Margaret Clifford, and in 1615 became custos rotulorum for the W. Riding, an office from which he was dismissed in 1626, being imprisoned in the same year for refusing to pay the forced loan. In the third Parliament of Charles I., Wentworth was the leader of the House of Commons, but in opposition to the king's the Mut!

organising abilities, which the authorities were not slow in using to good purpose in the administration of the country. He served in the India Office, and was made a member of the India Council. He was made a C.S.I. and G.C.S.I.

Strada, Famiano (1572-1649), a Jesuit priest, professor of rhetoric at the Cource of the Councillors, and on her death in 1631, he married in the following year Elizative Corporate College in Rome. He is the Corporate College in Rome. He is both Rhodes. In January 1632 he was appointed lord deputy of Ireland. but did not arrive there until July 1633. Under his 'thorough' system of government Ireland reached a pitch of prosperity to which it has attained neither before nor since. His aim was to make Charles an absolute despot, but there is no doubt that the despot, but there is no doubt that the country reaped much benefit from S.'s firm and wise rule. In 1640 he was created Earl of Strafford and Lord-Lieutenant of Ireland, and paid the penalty for being the chief ob-stacle in the path of the reformers. and was impeached of treason by the Long Parliament. The twenty-eight charges could not be proved, but a bill of attainder was brought in by the Commons, and passed in April 1641, and S. was executed on May 12, 1641, having exonerated the king from his murdered at Genoa. He is credited promise that he should not suffer in with ten operas, eight oratorios, in-cluding S. Giovanni Battista (pub-Cooper (1874) and Traill (1889). See

Cooper (1874) and Traill (1889). See also CHARLES I., LAUD, etc.
Strahan, or Macquarie Harbour, a scaport on the W. coast of Tasmania, Australia, and on the N.E. of Macquarie Harbour. Pop. 2000.
Strahlegg Pass, a glacial pass of the Bernese Alps, Switzerland, leading from Grindelwald to the Grinzel has

from Grindelwald to the Grimsel hospice. Height 10,995 ft.

of violas and violoncellos. See Life either a pull or a push. In the case by Messrs. Hill (new ed., 1909). of a pull the strain consists of an in-Straelen, a tn. in Rhenish Prussia, crease in length and a diminution in 27 m. N.W. of Düsseldorf. Its chief girth; in a push, the strain consists

creuse in girth.

Straits Settlements, a crown colony of Great Britain, comprising Singapore, Labuan, Penang, the Dindings, Province Wellesley, Malacca, and a number of small islands. They are situated in the E. Indies, on and of the Malay Peninsula. The total area is estimated at 1650 sq. m. (For particulars, see respective articles.) The ticulars, see respective articles.) by colony is administered by the of the Colonial

Colonial Engineer, Attorney-General, and Resident Councillor of Penang) and a Legislative Council (composed of ten official and eight unofficial members). It was transferred from the control of the Indian government to that of the Scoretary of State for the Colonies in 1867. The chief exports are sugar, pepper, sago, rice, gum, indiarubber, tobacco, coffee, etc. In 1911 the value of imp of exports

good ranwa.
Penang there is an electric tram system. The total pop. in 1911 was tem. The total pop. in 1911 was British diplomatist, born in London 114,069, of which 240,206
Malays, 369,843 Chinese, and natives of India. See Straits nat Lisbon. He was mate Rive Rook 1913.

ments Blue Book, 1913.

ments Blue Book, 1919.

Stralsund, a seaport of Germany, in the Prussian prov. of Pomerania, on the Strela Sound, is connected with the mainland by bridges. It has an old town-house (1306) and four Gothic churches.

The houses are Gothic churches. gabled and give a quaint, old-fashioned appearance. Leather, oil, fashioned appearance. sugar, playing cards, soap, cigars, etc., are manufactured. The town was founded by Prince Jaromar I. of Rügen about 1209, and became an important member of the Hanseatic League. It with stood a siege by Wallenstein (1628) during the Thirty Years' War. It was ceded to Sweden in 1648 and restored to Prussia in 1815. Pop. 33,981.

Stramonium, in pharmacology, the

dried leaves c jimson-weed. loids daturin

popular literature and trations. Founded in

W. T. Stead, the latter being the bills of the contents of the sole direction of the periodical. The seal of success was early set upon the seal of success was early set upon the venture by the now classic 'Adven-

of a decrease in length and an in-tures of Sherlock Holmes,' by Mr. (now Sir) Arthur Conan Doyle, while more recent numbers have been characterised by the no less classic humorist, Mr. W. W. Jacobs, with his brilliant studies of Thames riverside low life. Other notable series are Sir A. Conan Doyle's 'Adventures of Brigadier Gerard,' and the 'Hound of the Baskervilles.'

Strange, Sir Robert (1721-92), a Scottish engraver, born in Orkney. He studied engraving for a while in Edinburgh, but on the outbreak of the Jacobite rising in 1745 he joined Prince Charles's army. After Culloden he perforce left Scotland for the Continent, but eventually he was allowed to return home; and five years before his death he was years death years before his death he was knighted by George III. S. did a vast number of plates after the old mas-ters, while his works also include a fine original engraving of Prince Charles. See James Dennistoun, Memoirs of Sir Robert Strange, Loudon, 1855.

Strangford, Percy Clinton Sydney Smythe, sixth Viscount (1780-1855), a

envoy-extraordinary to the Portuguese court after its removal to Brazil at the beginning of the Peninsular War. Later he was ambassador to Sweden, Turkey, and Russia. On his retirement in 1825 he was ruised to the English peerage as Baron Penshurst.

Strangford, Percy Ellen Frederick William Smythe, eighth Viscount (1825-69), youngest son of the sixth viscount, born in St. Petersburg and educated at Harrow and Merton College, Oxford. He entered the dip-lomatic service and was Oriental sceretary during the Crimean War. His attainments as a linguist and philologist were greater than his published works attest.

Strangles, see Horse, Diseases of a culation. The

of the term is triction of the

in asthma, house of indpipe, as in hanging. In a case of etc. The leaves are smoked in a pipe of inthe form of eigarettes for asthma. Strand Magazine, the pioneer English monthly magazine of light the neck.

Strand Magazine of light the neck.

One of the strar one on the pipe of the strar one is the neck.

ie sac. If not relieved by

It trades in dairy produce. castle.

Pop. (1911) 6432.

Straparola, Giovanni Francesco (d. c. 1557), an Italian writer, born at Caravaggio. He is chiefly remembered on account of his *Tredici pia* cevoli notti, which is a series of stories in imitation of the Decameron (published 1550 and 1554). English translation by W. G. Waters (1894).

Strasburg, a tn. of Prussia, in the prov. of Brandenburg, 70 m. N. by E.

of Berlin. Pop. 6382.

of Berlin. Pop. 0352.
Strassburg, or Strasburg, the cap. of
the prov. of Alsace-Lorraine, Germany, situated at the junction of the
Ill and the Breusch, 2 m. W. of the
Rhine. It is a fortress of the first
class, the seat of a Roman Catholic
bishon. The university, founded in bishop. The university, founded in 1567 and suppressed during 1790-1872, has about 2000 students. The most interesting buildings are the cathedral, dating from the 11th to 13th centuries, the Protestant Church of St. Thomas (13th century), and the House of the Provincial Assembly. The manufactures are numerous and varied, but S. is famed for its pates de foie gras. S. (Roman Argentoratum) was the scene of a victory of Julian over the Alemanni (357). It became a flourishing imperial town, and numbered among its famous citizens Eckhart, Tauler, Gottfried von Strass-burg, Sebastian Brant, and Thomas Murner. It was selzed by France under Louis XIV. in 1681, but sur-rendered after siege to the Germans in 1870. It is the headquarters of a German army corps. Pop. 178,290. Strata Florida (Yelradflur), th

strata Florida (*Ystradflur*), the ruins of a Cistercian abbey in Cardiganshire, Wales, near the source of the Teifl. It was founded by Rhys ap Griffith, Prince of South Wales, in 1164, and suffered during the wars of Edward I. (1294). A western portal in the transitional Norman-English table (12th century) remains etyle (12th century) remains, and the foundations and some interesting

tiles have been excavated. Strategy and Tactics.

By strategy is understood the art of planning out a campaign in war; the gaining of advantage over an enemy before any actual conflict takes place. By successful chatter cessful strategy, for example, an enemy may be forced to battle in a position or locality unfavourable to himself; he may be caused to divide

Stranorlar, a tn. of Donegal, Ireland, on the R. Finn, 23 m. S.W. of Londonderry. Pop. (1911) 3300.

Stranraer, a scaport and royal burgh of Wistownshire, Scotland, on Loch Ryan, 6 m. N.E. of Portpatrick. Its chief building of interest is the old arranged and further modified during castle. It trades in dairy mediated the work consider the whole matter from sources, etc., and such plan as arranged and further modified during castle. the war constitutes the strategy. Success depends on a correct opinion as to the enemy's scheme, while arranging one's own plans in such a manner as may be unexpected by him. For such a purpose a thorough knowledge of the topography of the scene of war is of first importance, and both generals will consider from the first its strategical points. These are such that possession is vital to the scheme of campaign of the army holding them, the loss of any necesholding them, the loss of any necessitating change in strategy involving greater risk. Besides topography, climate and season are factors of early importance. Beyond this, again. come all plans aimed at crippling the resources of the enemy, particularly in the matter of trade and commerce, though in such a matter a general is apt to find difficulty owing to restrictions or interculty owing to restrictions or inter-ference by his government due to possible international complications. In arranging his mode of invasion, the starting points, lines of attack, and objections, strategy in its more complete and military sense is paramount; the main attack may be masked and the enemy misled; by special etrategical combinations points may be actually created. In offensive strategy, with the enemy on inner lines which he has had in all probability more time to strengthen, it is essential to prolong his uncertainty as to placing his main opposition as long as possible, and to lead him to change of idea and constant movement of forces, though defensive strategy by divining the true plan would consist in allowing the attack to waste energy in such a process. The Fabian policy against Hannibal is a classic example of defensive strategy, in which the plans of the attack were allowed to be carried out, only to lead to disaster. Wellington's strategical retreats in the Peninsular War were another example of leading attack to dissipate energy. One of Napoleon's great points of strategy was to lead opponents to attempt combination of forces and to anticipate them in time, defeating each in succession. Strategy, however, cannot be relied on to out-weigh deficiency in numbers, or want of training, organisation, and equipment; it rather consists in the artistic use of these. Tactics, while his forces or to unite them at great artistic use of these. Tactics, while disadvantage; he may be obliged to consisting often of strategy in minia-precipitate action, or submit to great ture or well-defined conditions, is the

much greater range, and signalling communications on the field of battle communications on the field of battle changes, so that a battle front may have become of increasing importance. Nevertheless, modern wars have shown that the old methods of the change by cavalry or bayonet, the use of the sword or lance, cannot be neglected. Under the head of tactics must be considered the arrangement of the attacking army in twit the land of tactics. rangement of the attacking army in and it they are to be succession, marching before contact with the carried out the training and organisa-enemy, the disposition of forces in tion in peace time must be thorough the field, the securing of controlling and sound positions, entrenching, taking cover, Stratfiel the keeping of reserves, the order in which detachments enter into conflict, the setting in motion of large or by small flanking movements. This We last matter gives a very good example of the difference between the two subjects discussed; for flanking movements may form part of the paul's, on the Great Eastern Railway. Laters in an engagement, yet a similar movement on a large and part of the paul's, on the Great Eastern Railway. It has chemical works, manules of similar movement on a large and point, and a way depict. Adjointenance with the army which may render a stratford-less stratford-les tion untenable by the enemy, the English cavalry by the Scottish at the battle of Bannockburn, with disastrous results to the former, who, however, having learnt the lesson, employed it against the French in the Hundred Years' War with quite equal success. The introduction of gunpowder produced a much slower change in tactics. but of fairfuld co., Connecticut, U.S.A., 5 m. N.E. of Bridgeport. Pop. (1910) gunpowder produced a much slower change in tactics, but of the same nature. The mere shock of charging nature. The mere shock of charging bodies and the hand-to-hand conflict, decisive only when cavalry came into action, was retarded by the excellent 1808, and minister plenipotentiary in archery of the middle ages, and still 1810. He excelled the treatment of the middle ages, and still 1810. He excelled the treatment of Bucharest for over a century by archery for over a century by archery musketry together; yet even a beginning of the 19th century was no great change. A more

term applied to the execution of formation was adopted and ranks plans, with variations as found im- were only two or three deep; the plans, with variations as found inmediately necessary, when actually musket and bayonet took the place in contact with the enemy. The lines of the musket and pike; the archers of battle being drawn out, the operations until victory is won or defeat simply a preliminary to hand to hand tions until victory is won or deleat similify a premimary to hand-to-hand sustained are tactical, and again fighting. Volleys were fired to mask merge into strategy until actual con- by their smoke an advance to charg-flict again arises. It is obvious that tactics is mainly a matter of the and the forces engaged at close study of contact in its fullest sense. The introduction of the work was a strategy been many ways ride and the superfected by the superfected while the content of the work was a strategy been and the superfected while the super Whereas stratesy has in many ways rifle and its perfected bullet made remained the same throughout histree and its perfected bullet made tory, tactics has been modified by greater; artillery has served the same the introduction of every new tool, end, and machine guns have further arm, method of fortification, etc. made a more open formation necessarmies may come into contact at sary. The rapid and sure means of sary. The rapid and sure means of communication and means of transand other methods of maintaining port have kept pace with these changes, so that a battle front may

Stratfieldsaye, or Strathfieldsaye, an estate in Hampshire, England, 7 m. N.N.E. of Basingstoke; given in 1817 by Parliament to the Duke of

Wellington. Stratford, a suburb of London and registration dist. of West Ham bor., for flanking Essex, England, 4 m. E.N.E. of St.

Stratford: 1. The cap, and port of entry of Perth co., Ontario, Canada, on the Avon and the Grand Trunk Railway, midway between Sarnia Trunkland Tournel and Tourn contact at all. As an important tactical discovery may be mentioned on the Aron and the Grand Trank the successful opposition to the Railway, midway between Sarnia charge of the armoured and mounted Tunnel and Toronto. It has chemical

Through the good offices of his cousin. and Turkey in 1812.

ervice at Switzerland became minister to

cessful in the settlement of the international questions arising out of the war of 1812. He was at Constantinople again in 1841 as ambassador, and remained there throughout the Crimean War, largely influencing the political reforms and foreign relations of Turkey and carning for himself the title of 'The Great Elchi' (great ambassador). His papers, etc., were published, with preface by A. P. Stanley, under the title of *The Eastern* Question.

Stratford-on-Avon, a market tn. and municipal bor, of Warwickshire, England, 22 m. S.S.E. of Birmingham. It is pleasantly situated in the wooded valley of the Avon. The river is crossed by a fine bridge, erected in 1496 by Sir Hugh Clopton, Lord Mayor of London. The town is famous as the birthplace of Shakespeare. Here may be seen Shakespeare's house in Henley Street, and his birth-room, on the walls of which can be found on the wants of while can be found the signatures of Scott, Dickens, Thackeray, and other distinguished visitors; Anne Hathaway's cottage in Shottery; the graves of the poet and his wife in the chancel of Holy with the three than the chancel of Holy with the chancel of Holy was the control of the chancel of Trinity; the site of 'New Place, Shakespeare's house in later life; King Edward VI.'s grammar school, and the red brick Shekespeare Memorial Theatre (1877-79), where performances of his plays are given annually. Stratford is a place of great antiquity. The chapel of the Guild of the Holy The chapel of the Guild of the Holy Cross dates from the 13th century, and Holy Trinity occupies the site of a Saxon monastery. Consult the works of Halliwell-Phillipps and Sir Sidney Lee, and Wheeler's History and Antiquities of Stratford-on-Avon, 1806; W. S. Brassington's Shake-pages Hopeland (new ed. 1913). spcare's Homeland (new ed. 1913); H. W. Tompkins' Stratford-on-Avon (Temple Topographies Series).

Strath (valley), a par. of Skye, Inverness-shire, Scotland, including Pabbay and Scalpay Is. Pop. (1911) 2500. Any long, wide valley is so called in Scotland. Strathspey has the R. Spey running through it.

Strathalbyn, a municipal township and tourist resort of Hindmarsh co., S. Australia, 28 m. S.E. of Adelaide. Gold, silver, and copper are mined. Pop. 1200.

Strathaven (Strathavon), a market tn. of S. Lanarkshire, Scotland, near Avon Water, 14 m. S.E. of Glasgov. It has a ruined 15th century castle. Manufs. include hosiery, cotton, and silk. Cattle and cheese are also produced. Pop. (1911) 4100.

Strathelyde, an ancient British (Welsh) kingdom which during the 7th-10th centuries occupied the basin of the Clyde and the neighbouring

the U.S.A. in 1820, where he was suc-| maritime districts. As it is sometimes called Cumbria, it is probable that at one time it extended into what is now called Cumberland. Its capital was

Alclyde (Dumbarton). See W. F. Skene, Celtic Scotland, 1876. Strathcona, a tr. of Alberta, Canada, situated opposite Edmonton on the Saskatchewan R. It is now in-

corporated in Edmonton.

Mount Strathcona and Royal. Donald Alexander Smith, Lord (b. 1820), was High Commissioner for Canada from 1896 to 1911; educated in Scotland. Entered Hudson Bay Company's service, and was the last resident governor; special commissioner during Riel rebellion in Red River settlements; member of the first Executive Council of N.W. Territory; represented Winnipeg and St. John's in Manitoba legislature, 1871-84; M.P. for Selkirk in Dominion House of Commons, 1871-72, 1874, and 1878; Montreal West, 1877-96; director of St. Paul, Minneapolis, and Manitoba Reilway, and of Commons, 1871-72. Railway, and of Canadian Pacific Railway Co.; hon. president Bank of Montreal; D.C.L., Oxford and Dublin; hon. LL.D. of Cambridge, Aberdeen, (Manchester), Laval, Yale, Glasgow, Victoria Dublin, Queenstown, Laval, Yale, Ottawa, and Toronto universities; chancellor of M'Gill and Aberdeen universities; lord rector of Aberdeen, 2000 and chancellor 1903 Af, his 1899, and chancellor, 1903. At his own expense he raised a troop of 600 men (Strathcona's Horse) who served gallantly in the Boer war (1899-1902). Created K.C.M.G., 1886. Strathmiglo, a vil. of Fife, Scotland,

chiefly engaged in the manuf. of linen. Pop. (1911) 1724.

Strathmore, a wide valley of Scot-land, bounded on the N. by the Grampians, and on the S. by the Lennox, Ochil, and Sidlaw Hills.

Strathnairn, Hugh Henry Rose, Baron (1801-85), a British soldier. paron (1801-86), a British soldier, born at Berlin, and entered the English army in 1820. In the war against Mehemet Ali in 1840 he was attaché to the Turkish army; was made consul-general of Syria, and chargé d'affaires at Constantinople from 1853 to 1854. In 1857 he was sent to command the Central Indian Army. command the Central Indian Army in India, and rendered exceptionally good service during the Mutiny, his operations excelling Sir Colin Campbell's in skill. He became commander-in-chief of the Indian Army on the death of Lord Clyde, and from 1865 to 1870 was commander-in-chief in Ireland. He was made a peer in 1866,

and field marshal in 1877 Strathpelfer, a vil. and health resort of Ross and Cromarty, Scotland, 44 m. W. of Dingwall. It has mineral m. W. of Dingwall. It has mineral springs. Pop. (1911) 360. Strathspey, a Highland dance do-

rived from the 'reel,' and originally trans., George Eliot, 1846.) In 1841 associated with the Spey Valley 42 he published Christliche Glaubens ('strath'), where it became popular lehre. Other works: Reimarus, 1862:

in the late 18th century.

of several works on hydraulics and navigation, and wrote a Marine Vocabulary. Filled the chair of navigation and mathematics at Padua.

Stratiotes, a monotypic genus of Hydrocharidacere, and its only species is S. aloides, the water-soldier. appearance it resembles a small aloe. and its dwelling is in rivers of Siberia

and Europe, including Britain. Strato, or Straton (Gk. Στράτων), a Greek Peripatetic philosopher of

Laërt. v.

Stratton, a par. and market tn. of Launceston div., N.W. Cornwall, England, 11 m. from Bude, a favourite summer resort. Pop. (1911) 2980.

Stratum, a layer or bed of sedimentary rock, formed by the consolidation of sediment laid down on the sea floor or lake bottom. The rocks which are arranged in strata are designated aqueous or stratified. See GEOLOGY.

Stratus, see CLOUD.

Straubing, a tn. of Bavaria, on the Danube, 25 m. S.E. of Ratisbon. It has some interesting old buildings, nas some interesting old buildings, including a 13th century tower, while its chief industries are brewing and tanning, and the manuf. of bricks, cement, and lime. Pop. 22,024.

Strausberg, a tn. in Brandenburg, Prussia, 20 m. E.N.E. of Berlin, engaged in textile manuf. Pop. 8233.

Strausberg, David Friedrich (1802.74)

Strauss, David Friedrich (1808-74), a theologian, born at Ludwigsburg, Würtemberg; studied under Baur Schleiermacher (Tübingen) and (Berlin); read Schelling, Böhme, and other mystics and idealists. Turning to Hegelianism, he rapidly developed it with a radical tendency to atheism. He became lecturer in philosophy at Tübingen in 1832; in 1835 appeared his Life of Jesus, in which he assumed rationalistic attitude, regarding commonplace Christianity as pseudo-mythological religion and Christ as a sort of Jewish Socrates. A storm of controversy arose, and A storm of controversy arose, and correctly, an externo of activations of certain modifications were made in various species of the genus Fragaria (order Rosaccæ). The fruit of the was forced to resign his new appointment at Zürich (chair of his bitter indignation ver the 1840 edition, in whic the 1840 edition, in whic

lebre. Other works: Remarus, 1000, Foldaire, 1870; The Old and New Faith, 1873. Works, ed. Zeller, 12 vols., 1876-78; Lives by Zeller, 1876-78; Lives by Zeller, 1985-9. Eck, 1899; and Ziegler, 1908-9. Strauss, Johann (1804-49), a famous for Other works: Reimarus, 1862;

dances; toured Germany, the Nether-lands, France, and England with his orchestra: composed about waltzes and a large number of galops,

quadrilles, etc.
Strauss, Ludwig (1835-99), a violinist, distinguished for his sound artistry, born at Pressburg; studied at Vienna Conservatoire under Bohm, Preyer, and Nottebohm; in 1856 met Liszt, whose friendly interest he aroused; toured Italy, Germany, and Sweden (1855-57), and England (1860), where, after a brilliant career as virtuoso and music director at Frankfort, he settled (1864); led the Halle Orchestra (1864-88).

Strauss, Richard (b. 1864), a composer, born at Munich, pupil of F. W. Meyer, succeeded Bulow at Munich in 1885; toured Europe, 1896-98; court - conductor at Berlin since 1898. One of the greatest living composers who has developed Wagner's traditions; he has written several operas, e.g. Feuersnot, Elektra, Salomé, Rosenkavalier, and Ariadne in Naxos. His instrumental compositions, chiefly symphonic or tone poems, are the finest of their kind ever written—Don Juan, Tod und Verklärung, Tyll Eulen-spiegel, Zarathustra, Heldenleben, and Don Quixote.

Straw, the stalk or stem of various corn crops such as wheat, barley, oats, rye, maize, leguminous crops, and also flax and hemp. In the newer countries of the world it is regarded as of little or no value, and is ofte"

mai ing, are vari

species and variety, and considerable attention has been paid in recent years to the production of varieties which by the strength or firmness of their straw do not 'lodge' or become laid,' though this is commonly due to lack of sufficient light, to over-crowding, and to excess of nitrogenous manures.

the fruit, Strawberry, the fruit, or more correctly, an otterio of achienes of

cast adrift from Christianity. (Eng. escape. From it and from the Chili S.

(F. chiliensis) and scarlet S. (F. the above head. The amount of virginiana) the cultivated varieties stress and strain that a substance are mostly derived. Ss. do best on a deeply worked loam enriched with decayed manure. The plants are set out in late summer or early autumn 18 in. apart, in rows 30 in. apart. When the bloom appears, long clean straw must be spread between the rows, partly as a protection against late frosts, but chiefly to keep the fruit clean. In September the ground should be thoroughly cleared, runners removed, and the soil well stirred and dressed with ash from the garden refuse fire. In February or March decayed manure should applied, and dressings of liquid manure, while fruit is being produced, are desirable. S. plants are propagated by allowing runners to root in

small pots containing light loamy soil.
Strawborry Hill, see Twickenham.
Strawboard, see Cardboard.
Streatham, a suburb of S. London, in the Wandsworth metropolitan bor., Surrey, England, 6 m. from St. Paul's, on various railways. There is a fine common of 60 acres. S. contains the British Home for Incurables (1894) and a Magdalen hospital. The site of Thrale Place, where Johnson used to visit, is in S. Park. Pop. (district) 132,165.

Streator, a city of Illinois, U.S.A., in Lasalle co., on Vermilion R., 50 m. N.E. of Peoria. It is a railway centre, and has important manufactures and coal mines. Pop. (1910) 14,253.
Street, a tn. of Somersetshire, Eng-

land, near to Glastonbury. C manuf. shoes. Pop. (1911) 4235. Chief

Street, George Edmund (1824-1881), an architect who was responsible for the new Law Courts built in the Strand at the close of the eighteen-sixties. S. only secured the commission after a great deal of rivalry and discussion. Much of his work was done in connection with churches, notably at York, Ripon, and Bristol. S. was a follower of the Gothic tradition. He wrote Gothic Architecture in Spain, and a new edition of this book was published in 1913 edited by G. G. King.

Strelitzia, a genus of Musaceæ which occurs exclusively in Africa, and contains only five species. S. reginæ is known as the queen's-flower, bird's-tongue flower, or bird-of-Paradise flower, because of its showy orange and blue colours.

Streltsi, or Stryeltsy, see RUSSIA-History.

Strength of Materials. Substances used for building purposes, such as wood, metal, etc., have a certain

will withstand before it breaks can only be determined by elaborate experiments on that substance with specially designed apparatus. Before making a structure it is necessary to know the kind and amount of stress to be laid on it. This known, the engineer must use material of suffi-cient strength and of suitable size and shape to resist this stress. There are four strains which a material may undergo, namely: (1) extension; (2) bending; (3) twisting; (4) compression. Whatever combination of these strains there may be, there are really only three resistances called into play, namely: (1) the tenacity of the substance, i.e., the resistance to extension; (2) the resistance to shearing strain (see ELASTICITY); and (3) the resistance to compression or crushing. For many substances (1) and (3) are the same, but for others, notably cast iron, the resistance to crushing is much greater than the tenacity. For engineering purposes the different strengths are classified under the following heads: (1) tenacity; (2) resistance to bending; (3) resistance to twist; and (4) resistance to thrust, i.e., resistance to a pressure applied at both ends. This is really a combination of a resistance to bending and a resistance to compression. See Todhunter and Pearson, History of Elasticity and Strength of Materials, etc.

Strepsiptera, an order which consists of tiny insects living in parasitic fashion inside the bodies of bees and There other hymenopterous insects.

is only one family, the Stylopidæ. Streptocarpus, a genus of Gesneriaceæ, found in Africa. It contains thirty species, usually known as Cape primroses, which are downy herbs bearing beautiful flowers generally of a purple or blue colour.

Streptococci, see BACTERIA. Stretchers, see BRICKWORK.

Stretford, a tn. of Lancashire, England, 3½ m. S.W. of Manchester. Pop. (1911) 42,496.

Stretto, sec Fugue.

Stretton, Hesba, the nom-de-plume of Sarah Smith, an English novelist. Her most famous work is Jessica's First Prayer (1867), published by the Religious Tract Society. She also contributed stories to Household Words and All the Year Round, and wrote numerous moral tales for the young.

Strickland, Agnes (1796-1874), an English historian, born near Southwold, Suffolk. She wrote in 1833, limit of resistance and yielding to Historical Tales of Illustrious British stresses and strains of various kinds. Children, and also for the young, Tales The study of this limit falls under and Stories from History (1836). Her best-known and more famous work, Father (his masterpiece), Inferno, written in collaboration with her esister, Elizabeth, is the Lives of the Gueens of England (1840-48). This was followed (1850-59) by Lives of See Miss Lind-af-Hageby's August the Queens of Scotland and English Stringberg (1913).

String Course, in architecture and Princesses.

Stricture, the narrowing of a canal in the body by inflammatory or other changes in its walls. The term is most commonly used of urethral S., caused by ulceration due to gonor-rheal infection. The S. should be kept open by occasionally passing a bougie into the channel. S. of the esophagus can be treated by dilatation with a bought to malignant ulceration, when food must be administered per rectum or backing.

Stroma, an island in Pentland Stroma, an island in Pentland and in Pentland tion with a bougie unless it is due circuiting or by cutting out the affected portion.

Striegau, a tn. in Silesia, Prussia, 33 m. W.S.W. of Breslau. The chief manufs. are leather, machinery, cigars, and brushes. Pop. 14,574.

Strigidæ, sec Owls. Strike, of strata, is the direction of a line drawn at right angles to the true dip or inclination of the beds. The S. coincides with the outcrop when the surface of the ground is level and when the beds are vertical. It may be a straight line or may curve in every direction according to the behaviour of the dip, and thus in a basin-shaped bed the S. will be a complete circle. Faults may produce

sudden changes in the S.
Strikes, see TRADE UNIONS.
Strindberg, Johan August (1849-1912), a novelist and dramatist, born in Stockholm, educated at Upsala University; originally forced poverty to teaching and journalism, and engaged in the Stockholm Royal Library from 1874-80. His work, consisting of fifty-five plays, thirteen volumes of short stories, seven novels, and forty other volumes, is mostly imbued with the deepest pessimism and bitterness. Typical of his pungent realism is the *Red Room* (1879), a first - period book wherein is first brought forward his characteristic hatred of women, despite which he S. are known, the monoxide and has thrice married. His anti-feminism has caused much controversy with the Ibsenites. A fanatical with the insentes. A tableton egotist, he has written many pseudo-autobiographies, e.g. The Son of a nutobiographies, e.g. The Son of a fixer at the solution of S. are soluble in water. They insert a crimson colour to the finme, son) (1886), and The Confessions of a Fool (1893). His later tendencies a Fool (1893). His later tendencies are the solution of the solut are religio-mystical, c.g. Towards manufacture of beet sugar.

Damascus (1898). There is little Strood, a tn. of Kent. E. Damascus (1898). There is litt doubt of S.'s insanity. Translatio in English have been issued of t above, and of In Midsummer Da (prose), Easter, Miss Julia,

String Course, in architecture and building, a projecting course of masonry or bricks which forms a string or horizontal line on the face of the wall. In Gothic architecture such S. Cs. usually consist of a series

of mouldings.

Stringhalt, or Clicking, a sudden spasmodic twitching of the muscle of one or both hind legs of a horse. An animal so affected is classed as unsound, though it can carry heavy loads forwards, but has difficulty in

of gastropod treptoneura,

are known "he species popt ĥανε redunctes. and large and elaborate. They are very active in habit and move in a series of leaps.

The chief genera are Strombus and Pterocarpus. Stromboli, a volcanic island of the Lipari group, situated N. of Sicily.

The active volcano has a height of 3040 ft.

Stromness, a seaport tn. in Pomona, Orkney Is., 13 m. W. by S. of Kirk-wall. The chief industry is fishing. Pop. (1911) 1656.

Strömstad, a scaport tn. in the län of Göteburg, Sweden, on the Skager It exports granite. Rack. (1911) 2978.

Strontium (Sr. 87.6), a metal of the alkaline earths, which occurs in

nature as strontianite (SrCO,) and celestine (SrSO₄). The metal is obtained by the electrolysis of the fused chloride and is white in colour. readily oxidises in air and decomposes in water at ordinary temperatures (melting point 800°, sp. gr. 2.5). Heated in hydrogen it forms a hydrogen in the form of the hydrogen in the dride (SrH.) which when heated in vacuo yields pure S. Two oxides of

hydroxide sulphate,

Strood, a tn. of Kent, England, on mosite Rochester.

· k. groódos, cord; us of Apocymacca. the species of which are found from South Africa to China. There are over twenty of these, and they consist of small trees or shrubs bearing peculiar flowers which have long and threadlike lobes on their petals. S. hispidus yields the ince poison.

Strophe (Gk. στροφή, a turning), a term used in versification to denote a collection of prosodical periods, combined into a structural unit.

Strophulus, an eruptive affection occurring in infants, characterised by small red papules and caused by digestive troubles. It is popularly known as 'red gum' or 'tooth-rash.'

Strossmayer, Josef Georg (1815-1905), an Austrian Roman Catholic bishop, born at Essek, and educated at Budapest and Vienna. Ordained in 1838, he was shortly afterwards appointed professor at the Diakovar Seminary, and consecrated bi-hop of Bosnia and Sirmio. In the Vatican Council he was the leader of those who opposed the dogma of papal infalli-bility. He wrote Monumenta Sla-

vorum Meriodinalium.

Stroud: 1. A market tn. of Gloucestershire, England, on the Stroud-water Canal, 8½ m. S. by E. of Gloucester. For many centuries broadcloth and scarlet-dved cloth have been manufactured in the neighbourhood. S. also has manufactures of pins, carpets, and umbrellas. There are also breweries, silk mills, dyeworks, and iron foundries. Pop. (1911) 8772. 2. A tn. of New South Wales, in Gloucester co., 32 m. N. by E. of Raymond Terrace. There is a gold-field in the neighbourhood. Pop. (district) about 4000.

Stroud Green, a northern suburb of London, in Middlesex, England, 5 m. N. by W. of St. Paul's. Structural Steelwork is commonly

understood to mean steelwork applied to buildings and to engineering structures other than bridges. The adoption of steel for such uses was preceded by the application of wrought iron in the same way, the earliest example of which was given by Wm. Handyside, who about 1840 built up wrought-iron beams for buildings in St. Petersburg. In this country S. S. was first applied to roofs, later to beams and stanchions. Rolled fron beams, largely used in floors, were introduced as 'double tees' in 1853, and later were made of steel. S. S. was primarily used in buildings for members previously made of timber or east iron, but in steel framed buildings, first constructed in America, the steelwork itself carries the walls, which, being weather screens simply, are thin, thus in tall buildings economising floor space. 'Sky-scrapers' of twenty

U.S.A., but the building laws of Great Britain do not permit such construc-The work of design was first systematised in America, where the practice was introduced of assuming the total live loads carried by stanchions and foundations to be less than the sum of all the live loads which each floor was required individually to carry on occasion. To facilitate to carry on occasion. To facilitate computations tables were also pre-pared of the beating capacities of rolled and built-up beams, and stanchions of various sections. Drawingoffice work was also economised and manufacture cheapened by the use of standard details and connections. The unit stresses observed in this country are commonly limited to 74 tons per so, in, on beams, and 6 tons on compression for short stanchions. with a sliding scale reduction as the ratio of length to section stiffness increases. The foundations under stanchions are sometimes complicated arrangements of joists, or 'grilles,' used to spread weight—in special cases where the property limits require it, stanchions are supported on the projecting ends of cantilever beams properly secured for stability. In all tall and narrow buildings wind effects have to be provided for by diagonal bracing or by stiffening knees between floor girders and uprights. Steelwork alone, though incombustible, cannot be considered immune from fire, for which reason it is good practice to encase it in concrete, terra-cotta, or other fire-resisting material. The cost of steelwork in a framed building may be about 2d. per cubic ft. of contents. while the cost of design varies from 2s. 6d. to as much as £1 per ton of Roofs of large span are steelwork. always constructed of S. S. It is applied also to such varied uses as tanks, reservoirs, bins, lighthouses, gantries, dock-gates, caissons, etc. In recent years reinforced-concrete has proved a very serious rival to S. S. See Freitag. Architectural Engineer-ing; H. Fidler, Construction in Mild Steel; Farnsworth, Constructional Steelwork. Struensee, Johann Friedrich, Count

(1737-72), a celebrated political adventurer, was the son of a clergyman at Halle in Saxony. He studied medicine, taking his degree of Doctor in 1757. In 1768 was appointed physician to the king of Denmark, whom he accompanied on his tour to Germany, France, and England. Soon after the marriage of Christian VII. with Princess Matilda of England, a coolness was observed between the king and queen. The queen, observent he internation of the contract of the contraction. ing the influence of S. over the king. sought by his means to effect a reconfloors or more are common in the ciliation with her husband and suc-

ceeded. S. was later convicted of is a crystalline solid, insoluble in treason, and sentenced to lose his water, but soluble in alcohol and right hand, to be beheaded, and quartered.

Struma, another term for scrofula

(q.v.).

Struma (Turkish Kara-Su), a riv. of Bulgaria and Macedonia, rising in the former country and flowing into the Gulf of Rendina.

Strut, in framed structures, any pillar or beam that supports a weight

or lateral thrust.

Struthers, Sir John (1823-99), a Scottish anatomist, born at Brucefield. Dunfermline. After qualifying in Edinburgh, he became assistant surgeon to the Royal Infirmary of that city (1854), and afterwards pro-fessor of anatomy at Aberdeen (1863-89). He was also president of the Royal College of Surgeons, Edinburgh (1895-97).

Strutt, John William, see RAYLEIGH, JOHN WILLIAM STRUTT, THIRD BARON.

Joseph (1749-1802), an English artist and antiquary, born at Springfield, Essex. Apprenticed to the engraver Ryland. Published his first work, Regal and Ecclesiastical Antiquities of England, in 1773, containing representations of the English monarchs from Edward the Confessor to Henry VIII. This was followed by Biographical Dictionary of Engravers; Complete View of the Dresses and Habits of the People of England; Ancient Times; Sports and Pastimes, etc. See ed. by J. C. Cox, 1904. Struve, Friedrich, Georg Wilhelm (1793-1864), a German astronomer,

born at Altona and educated at Dorpat University, where he was appointed director of the Observatory (1817). In 1839 he was transferred to the new observatory of Pultowa, where he remained till 1861. He was specially occupied with researches on double stars, of which he published his observations in 1827, 1837, and

Struve, Otto Wilhelm (1819-1905), a German astronomer, son of F. G. W. Struve, born at Dorpat. He became his father's chief assistant at Pulkowa, and in 1862 was appointed director of that observatory. He was also chairman of the International Astronomical Congress (1867-78) and president of the International Congress for a

Photographic Survey of the Stars. Stry, or Stryj, a tn. of Galicia, Austria, 41 m. S.W. of Lemberg. Chief industries are tanning and the manufacture of matches. Pop. 30,203.

Strychnine (C₂₁H₂₂N₂O₂), an alkaloid occurring in Strychnos nuxvomica,

chloroform. It has an alkaline reaction and a bitter taste; optically it is lævorotatory. The alkaloid and its salts are used in medicine as tonics and stimulants. It is especially employed in collapse from alcoholism, pneumonia, emphysema, etc., the dose being under to grain. In larger doses it acts as a powerful poison, one grain being a fatal dose in many instances. The symptoms of poisoning commence with a stiff neck, and shortly the patient is seized with tetanic convulsions, the muscles being contracted for a minute at a time: often the body is thrown into the form of an arch, the patient resting on his head and heels. The treatment must commence with emptying the stomach with an emetic or Chloral and potasstomach-pump. sium bromide have been found useful

in counteracting the spasms.
Strychnos Nux Vomica, an Indian tree of the order Loganiacee. It contains several alkaloids, the chief of which are strychnine and brucine.

Stryj, a riv. of Austria, rising in the Carpathians and flowing into the

Dniester.

Strype, John (1643-1737), an English ecclesiastical historian and biographer, born at Houndsditch, London, was the author of Memorials of Thomas Cranmer (pub. 1848-54), Life of the Learned Sir John Cheke (1705). Annals of the Reformation in England

Annals of the Reformation in England (4 vols., 1709-31), etc. He obtained the curacies of Theydon Bols and Leyton, in Essex (1669), the sinecure of W. Tarring, Sussex (1711), and a lectureship at Hackney (1689-1724). Stuart (or Stewart), Charles Edward Louis Philip Casimir (1720-88), known as the 'Young Pretender,' being the elder son of the Chevalier de St. George, the 'Old Pretender,' born in Rome. He served in the wars of the Rome. He served in the wars of the Polish and Austrian Succession, distinguishing himself when very young at Gata (1734) and Dettingen (1743). In 1743 he headed an unsuccessful French invasion of England, but in 1745 succeeded in landing at Eriska in the Walthirds of the Polish of the Polish Court of in the Hebrides. Marching south-wards, he entered Edinburgh and held his court at Holyrood. He de-feated Cope at Prestonpans. With a feated Cope at Prestonpans. troop of 6500 men he invaded England, and marched as far S. as Derby, when prudence urged him to retreat to Scotland. There he was again victorious at Falkirk (1746), but was overwhelmed by Cumberland at Culloden, and for many months hid in the fastnesses of the Highlands with S. colubrina, S. ignatii, S. icaja, and the fastnesses of the Highlands with other trees of the same genus. The £30,000 on his head. Before the end alkaloid is contained with brucine in the bark, leaves, seeds, and root. S. whence he was expelled in 1748. He

Stuart, Arabella, or Arbella (1575-1615), the only child of Charles S., Duke of Lennox, younger brother of Henry, Lord Darnley, the father of James I. James and she, therefore, were full cousins. She was, before the birth of his son Henry, in Feb. 1594, the next in order of succession to the birth of his son Henry, in Feb. 1594, the next in order of succession to the English throne to James. She first in December, when the king had became an object of get attention by the manner of the Prince of Orange, name was brought forwater the accession of James, in the Affair of the alleged plot called the Main, for which Sir Walter Raleigh was tried. One of the charges against He served attention of James III. Raleigh was that he designed to raise the Lady Arabella to the throne, under the protection of Spain. There is no probability, however, that any such design ever was entertained. Her situation, however, was a difficult and dangerous one. She was secretly married to William Seymour, second son of Lord Beauchamp, the eldest son of the Earl of Hertford; but it was discovered in 1610, and Seymour and the lady placed in Arabella esseparate confinement. caped from Hishgate and Seymour escaped from the Tower. Seymour reached Flanders in safety, but Arabella was captured in Calais Roads and placed in the Tower, where she died insane.

Stuart, Gilbert Charles (1755-1828), an American artist, born at N. Kingsan American artist, born at N. Kingstown, Rhode Is., and studied in England under Benjamin West. After living in Ireland (1788-92), he returned to America, where he met with great success. His chief portraits are of Washington, John Adams, Jefferson, Winthrop, Sir Joshua Reynolds, and Horace Binney. See Life by G. C. Mason, 1879.

Stuart (or Stewart), Henry Benedict Maria Clement, Cardinal York (1725-1807), called by Jacobites Henry IX., was the second son of the Chevalier de St. George, the 'Old Pretender.' He took part in the rising of 1745, and on his return to Italy became Bishop of Ostia and cardinal (1747). Archbishop of Corinth (1759), and Bishop of Tusculum (1761). See Thornton's The Stuart Dynasty, 1891. Stuart (or Stewart), James, see

MORAY.

Stuart, James (1713-88), an English painter and architect, distinguished by the name of 'Athenian Stuart.' Stubbs, George (1721-1826), born at He originally painted on fans for Liverpool and settled in London as a Lewis Goupy, the painter. In 1761 painter of animals. He completed in he travelled with Nicholas Revett in 1766 his work On the Anatomy of the

is supposed to have visited England Greece, and afterwards published on secret conspiracies in 1750, 1752, Antiquities of Athens (1762), which and 1754, and spent the remainder of awakened a keen interest in Greek his life as a fugitive on the continent. architecture. S. built Lord Anson's Sec Lives by Ewald (1875), Lang house in St. James's Square in the (1900), and Norie (1903-4). had a great vogue in London.

Stuart, James Francis Edward (1688-1766), Prince of Wales, commonly styled the 'Chevalier de St. George, and later known as 'The Old Pretender,' was the son of James II. by French army before the Peace of Utrecht, and in 1715 went to Scotland to take part in the unsuccessful Jacobite rising. He married Maria Clementina Sobieski in 1719, but his conduct as a husband alienated many of his followers. He provided money for the rising of '45, but his interest in the attempt to secure his restora-

tion was languid. Stuart, John, see Bure, third

EARL OF.

Stuart, John (1813-77), a Scottish antiquary and advocate, was educated at Aberdeen University. He was attached to the Register House, Edinburgh (1853-77), became secre-tary to the 'Spalding Club' (1839-70), and wrote Sculptured Stones of Scot-land, 1856 and 1867; The Book of Deer, 1869, etc. Stuart, Moses (1780-1852), an

Stuart, Moses (1780-1852), an American biblical scholar, born in Wilton, Connecticut, and educated at Yale, where he became tutor. He was appointed pastor to the Centre (Congregational) Church of New Haven (1866), professor of sacred literature at Andover (1810-18). He published a Hebrew Grammar, 1813: Letter to Dr. hanning on the Swigest

of Religious Liberty, 1830; Hebrew Chrestomathy, 1829-30, etc. Stuart-Wortley-Mackenzie, James Archibald, see WHARNCLIFFE, BARON. Stubbs, Charles William (1845-1912), Bishop of Truro and expositor of the modern Christian social movement. Author of Christ and Democracy, 1884: Christ and Economics, 1893; Christ and Liberty, 1883; A Creed for Chris-tian Socialists, 1897; The Social Creed of a Christian Democrat, 1894, etc. Bishop Stubbs was a Christian social reformer of a moderate type.

Horse, in eighteen tables; and before his death three numbers of another work under the title of A Compara-tive Anatomical Exposition of the Structure of the Human Body with that of a Tiger and a Common Foul, in thirty tables. Many of his produc-tions have been engraved. His Spanish Pointer, engraved by Woollett, is a fine specimen.

Stubbs, John (1543-1591), an Elizabethan pamphleteer, was educated at Corpus Christi College, Cambridge. When the Duke of Anjou became a suitor for the hand of Queen Elizabeth, S. published a pamphlet against the marriage, for which he was con-demned to lose his right hand.

Stubbs (or Stubbes), Philip (c. 1555-c. 1610), the author of several very curious works written with a touch of the conceit of the Euphuists of the 16th century. The Anatomi Abuses is his best-known work. The Anatomic of He also wrote a life of his wife called A

Christal Glass for Christian Women. Stubbs, William (1825-1901), an English historian and prelate, born at Knaresborough, and educated at Ripon Grammar School and Oxford. From 1850 to 1866 he held the living of Navestock, Essex, and was then appointed professor of modern history at Oxford. In 1884 he was conse-crated bishop of Chester, and five years later translated to the see of Oxford. Chief work, Constitutional History of England. Also published, Lectures on Mediaval and Modern History, Registrum sacrum anglicanum, etc. See Letters (ed. by W. H. Hutton), 1904.

Stucco, an Italian word applied in most languages to plaster of any kind used as a coating for walls to give them a finished appearance. Stuccowork or stuccatura is interior orna-ment in imitation of carved stone.

Stud-Book (A.-S. stod, a breeding mare), a register showing the genealogy of particular breeds of animals, such as cattle and horses, but mainly

digree of horses

of horse-racing. Studley, a par. of Stratford-on-Avon dist., Warwickshire, England, 13 m. W. of Warwick. Bodkins, needles, and fish-hooks are manufactured. Pop. (1911) 2600.

Stuerbout, Diereck, a Dutch painter established at Louvain about the middle of the 15th century. In 1468 he executed two striking paintings with life-size figures illustrating ' The Golden Legend,' now in the Brussels Gallery. In 1472 he painted a large altar-piece of 'The Last Judgment,' and other works have been assigned to him, about which there is a good deal of uncertainty.

Stuffing, see TAXIDERMY. Stuhlweissenburg, a tn. in the co. of Stuhlweissenburg, Hungary, 35 m. S.W. of Budapest. It was originally

the coronation place of the kings of Hungary, and is an episcopal see. Chief manufs, are knives and woollen

goods. Pop. 33,000.
Stukeley, William (1687-1765), an English antiquary, practised as a doctor in Boston (Lincolnshire), London, and Grantham, and after 1729 was successively vicar in Stamford, Somerby, and Queen Square, London. He pub. Stonehenge (1740) and Abury (1743).See Family Memoirs of Stukeley, 1882.

Sturdy, or Gid, a disease of young

sheep (q.v.).

Sture, Sten, the name of two regents of Sweden: Sten Sture, the Elder (1440-1503), raised levies from the peasants and twice defeated Christian I. of Denmark, the second time (1471) at the battle of Brunkebjärg. Although he was obliged to acknowledge the suzerainty of Hans, King of Den-mark and Norway (1483), and im-paired his country's strength with a Russian war, he was a great states-man and encouraged learning by founding the University of Upsala. Sten Sture (1492-1520) was the son of Svante Sture (q.v.). His brief but stormy rule was absorbed with the humiliation of his rival, Archbishop Trolle, whom he immured in a monastery after capturing his stronghold of Stake (1516), and, further, with three great battles against Christian II. of Denmark: at Vedla and at Bränkyrka (1518) he was victorious, but during the third, fought near Borgerund, he received a mortal wound.

Sture, Svante (d. 1512), regent of Sweden, succeeded his uncle in this office. In early years he assisted King Hans, and latterly he opposed

Danish aggressions.

Sturgeon, William (1783-1850), an English electrician, born of humble parentage and served as a private in the Royal Artillery. At his death he was lecturing on science at the Royal Victoria Gallery, Munchester. His inventions were practical applications of the theories of Oersted. Faraday, and Ampère, and included an electro-magnetic machine made of soft iron (1825), and an acid bath for plates of rolled zine in galvanic batteries.

Sturgeon Bay, a vil. with a good harbour and canal connection with Lake Michigan, on the E. of Sturgeon Bay, in Door county, Wisconsin, U.S.A. There are lumber mills. Pop. (1910) 4262.

Sturgeons, the fishes which constitute the family Acipenseride in the order Chondrostei. They are large mouth is small, has no teeth, and in front of it are four barbels. S. are voracious feeders on small animals and plants, they are themselves eaten by man: caviare is made from the ovaries and isinglass from the airbladders of several Russian and American species. Of the twenty or so species only Acinenser sturio is found off British coasts.

Sturlason, or Sturluson, see SNORRI. Sturm, Or sturioson, ee Sookin, Sturm, Christoph Christian (1750-86); a German author and divine, was from 1778 pastor of churches in Hamburg. A rare picty illuminates his Betrachtungen über die Werke Gottes im Reiche der Natur und der Forschung auf alle Tage des Jahres (1785) and also his sacred songs.

Sturm, Johann Christoph (1635-1703), a German natural philosopher, was for eight years pastor in a church near Ettingen, but in 1669 accepted the chair of mathematics in Altdorf University. His Collegium Experi-University. His Collegium Experi-mentale (1672) is a treatise on physics, which betrays the influence of De-cartes.

Sturm. Johannes (1507-89), a German humanist, was educated at the universities of Liège and Louvain. and after a residence in Paris became 1538 rector of the Strasburg gymnasium, which was later (1566)

constituted a university.

Sturm, Julius Karl Reinhold (1816-96), a German poet, spent four years (1837-41) following the theological course at Jena. From 1857 till 1885. the year of his retirement, he was minister in his native village of His Fromme Lieder (1852-92) and Israclitische Lieder (3rd ed., 1881) are pervaded with a fervent religious spirit, whilst a note of stirring patriotism accounts partly for the popularity of his numerous Gedichte.

Sturminster, a vil., 10 m. E.S.E. of Sherborne, on the Stour, in Dorset-shire, England. Pop. (1911) 1900.

Sturm und Drang, see GERMANY-

Language and Literature.

Sturt, Charles (1795-1869), was born in India, and entered the army. He served in the Peninsular War and in the War of the Lakes. Although S. established a reputation as a gallant soldier, his claim to remembrance arises from the explorations which he made in S. Australia.

Stuttering, see STAMMERING.

Germany, cap. of the kingdom of Wittemberg, on the Nesenbach, an affluent of the Neskar 37 m S

and have elongated bodies, bearing wooded mountains. The chief fea-five rows of large bony scutes: the tures of interest include a 16th-century castle now utilised as government. offices, a magnificent palace, the Akademie, and one of the finest libraries in Europe. The manufs. are varied and numerous, and the city is a centre of the printing and publishing trades. The village of Cannstadt. with its mineral springs, is now included within the city limits. Hegel was a native. Pop. 285,589.
Stuyesant. Peter (1592-1692). a

Pop. 280,000. Peter (1592-1692), a leg Stuyvesant, Peter (1592-1692) Dutch colonial governor, lost a whilst fighting in Saint Martin (West Indies). Governor of New Amsterdam (afterwards New York) from 1647-64, he ceded the city in the latter year to James, Duke of York. Stye, or Hordeolum, inflammation of the medified expect claude between

of the modified sweat glands between the eyelashes. It commences with a hardening of the skin about the part, followed by swelling and soreness. Suppuration of the lower layers of the skin next takes place, and the central core subsequently sloughs off. Gentle fomentation sloughs off. Gentle fomentation tends to ease inflammation; care should be taken not to irritate the conjunctiva.

Style, Old and New, see CALENDAR. Stylites, St. Simon, or Simeon (Gk. στῦλος, pillar), a monk of Syria in the 5th century, who spent the last thirty years of his life on a pillar, 72 ft. high and 4 ft. square at the top. erected near Antioch. He preached by day, and crowds of pilgrims flocked to receive his exhortations. He died in 459 at the age of seventy-

two.

Styrax, see STORAX.

Styria (Ger. Sleiermark), a duchy and crownland of Austria, with an area of 8662 sq. m., bounded by Upper and Lower Austria (N.), Hungary and Croatia (E.), Carniola (S.), and Carinthia and Salzburg (W.). Its surface is diversified by the outlying spurs of the eastern Alps, the Dachstein (9830 ft.), Hochgolling (9390 ft.), Predigtstuhl (8349 ft.), Grosser Bösenstein, and the Eisenhut reaching the highest eleva-The chief rivers are the Save and the Drave in the S., the Enns in the N.W., and the Raab and the Mur in the central districts. Half the duchy is still forest lands, and maize, oats, rye, and roots are cultivated. There are rich deposits of iron and coal, and scythes, sickles, and other iron and steel goods are manufactured in large quantities. Köflach. Eisenerz. Leoben, Wittemberg, on the Resembach, an Vordernberg are centres of mining affluent of the Neckar, 97 m. S.E. of districts. There is a university at Frankfort. It occupies a pieturesque position in a valley environed with parts of Noricum and Pannonia vine-clad hills, and further off with represented S. Pop. 1,441,604.

στυγέω, to hate or abhor), the name of i the principal river in the nether world. around which it flows seven times. S. is described as a daughter of Oceanus and Tethys. Oceanus and Tethys. As a nymph she dwelt at the entrance of Hades, in a lofty grotto supported by silver columns. As a river S. is described as a branch of Oceanus, flowing from its tenth source; and the river Cocytus again is a branch of the S.

Suabia, see SWABIA. Suaheli, sce SWAHELI.

Suakin, a decaying seaport of the Egyptian Sudan, situated on an island in the Red Sca near the coast, with which it is connected by a causeway. Owing to its unhealthy climate, its importance has declined, and it has been superseded by Port Sudan. It is the port of embarkation for the Mohammedan pilgrims to Mecca, who disembark at Jiddah. It still trades in ivory, gums, cattle, mother-o'-pearl, etc., but its population of 11,000 is steadily decreasing. It has railway communication with Berber, Port Sudan, and Atbara.

Suarez, Francisco (1548-1617), a Spanish philosopher, was largely in-fluenced in his determination to enter the Society of Jesus-which he enter the Society of Jesus—which he actually did in 1564—by a powerful sermon of Ramirez, which he heard whilst a student at Salamanca. S. was professor of theology at the College of the Society in Rome (1580-88), and at the universities of Alcala (1588-96) and Coimbra (from 1597). He greatly incensed onward). James I. by remonstrating against the oath of allegiance in his Defensio catholica fidei contra anglicana secta errores, 1613.

Subahdar, a title for native captains in the Indian army.

Subaltern, see LIEUTENANT.

Subconsciousness, see Psychology. Subiaco: 1. A tn. of Italy in the prov. of Rome, 33 m. E. by N. of Rome, picturesquely situated in the Sabine Mts. The leading features of the town are two ancient Benedictine monasteries, Nero's villa, and an 11th-century castle, all in ruins. Here it was, in 1464, that printing was first introduced into Italy. industries are connected with iron and paper. Pop. 8000. 2. A N.W. and paper. Pop. 8000. 2. A N.W. suburb of Perth, W. Australia. Pop. 3500.

Subinfeudation, see LAND LAWS.

(connected with the verb, direct, internal, or subjective way, by directing attention to what is going on in the mind at the time of its occurrence or afterwards. So we can attend to any feeling, to see what its nature is, what are its parts, and how it is affected by any particular cir-cumstances. This is known as introspection, or the method of internal or subjective observation. On the other hand, we may study mental phenomena as they present themselves externally in other minds. This constitutes the external, indirect, objective method of observation. . So, for example, we arrive at a know-ledge of others' thoughts by their speech, or observe their motives by straction is

of our own mental life, and to withdraw attention from the more striking events of the external world and to fix it on the more obscure events of the inner world is obviously a difficult task. On the other hand, there is a tendency, in reading the minds of others, to project our own modes of thinking and feeling into them. Clearly to apprehend the sentiments of an uncivilised African is a difficult task, involving close attention to differences and similarities of external manifestation, and an effort of imagination by which, through our own remembered experiences, we feel our way into a new set of circumstances. See Sully's Outlines of

Psuchologu. Šubleyras, Pierre (1699-1749). French painter, born at Usez. S. first studied painting under his father, and at the age of fifteen was placed with Antoine Rivalz of Toulouse. to Paris in 1724, and in 1726 gained the grand prize given by the French Academy for his 'Brazen Serpent,' and in 1728 he was accordingly sent to Rome, with a pension from the government. In 1739 S. married government. Maria Felice Tibaldi, a distinguished miniature painter, and they were both elected members of the Academy of St. Luke. S. was patronised by popes, cardinals, and the Roman nobility. There are several fine pictures by S. in Rome, and a few in France (eight in the Louvre). His execution was delicate, he composed well, and was an agreeable colourist.
Sublimation. When a solid, on the application of heat, passes

subject and Subjective. 'Subject straight to the gaseous state without thing or as affected by a thing, while object is that which is known or which affects the mind in a certain way. The fact that the boling-point of the solid house I see is the object to me, the subject who sees and admires' point at the pressure of the atmosphere. Thus by increase of pressure

a substance which sublimes can be shore station. before passing into the gaseous state. By sublimation, non-volatile im-purities which are originally present are left behind, and thus a method of purifying substances which sublime is established. Arsenious acid, ben-zoic acid, corrosive sublimate and sulphur are purified by this means. When calomel (mercurous chloride) is sublimed, dissociation takes place, a certain amount of recombination place on cooling. ammonium chloride, the substance is dissociated into ammonia and

is dissociated into animona and hydrochloric acid, which recombine on cooling. See Dissociation.

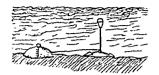
Sublingual Glands, the smallest of the salivary glands, situated one on each side of the floor of the mouth, beneath the tongue. They have numerous ducts, which open along the sublingual fold in the mucous membrane of the floor of the mouth.

Submarine Forests are evidence of the subsidence of the land. They the subsidence of the land. They occur along the Firths of Forth and Tay, on the coasts of Devon, Cornwall, Somerset, Lancashire, and at Grimsby on the Humber. Generally, these forests are rarely depressed far below high-water mark, and consist of beds of peat, some 2 to 6 ft. thick, abounding in trunks and roots of trees in the lower portion and in trees in the lower portion, and in mosses in the lighter-coloured upper portion. The trees are chiefly oaks, Scotch firs, alders, hazel, etc., and throughout are embedded hazel nuts,

plant seeds, and wing cases of insects. Submarine Mines are explosives concealed beneath the surface of the sea for the protection of river-mouths, harbours, etc., against a hostile fleet. They are usually charges of wet guncotton contained in spherical cylindrical steel casings, sometimes with a lining of concrete. A charge of 500 lbs. is sufficient to destroy the largest vessel. Wet gun-cotton is used



Floating mines are made to go through a liquid stage moored to anchors or heavy weights, before passing into the gaseous state. so that they float out of sight, but not too deep for contact, or they may be placed, if water is not too deep, on the bottom; this latter type may be smaller but more effective, containing no air for floating purposes. Often the mine floats low or lies on the



bottom, with a float attached containing the firing mechanism. To allow passage of friendly vessels, these floats are sometimes kept low, but can be released by exploding a small charge, when they rise to a position of contact; the mine itself may be kept on the bottom and released in a similar fashion. The attacking fleet counter-mines or



' drags.' In the former, the suspected area is strewed with mines which are area is strewed with mines which are exploded in the hope of firing the defensive mines; in the latter, an extremely dangerous process, two vessels steaming well apart carry forward a cable fitted with grappling irons. When grappled, the mooring cables can be cut and the mine exploded on toward arms. ploded or towed away. Countermining is not a very certain method,



because it is difficult to fire and is concussion being generally insuffibecause it is difficult to fire and is concussion being generally insulinunder safe control; it may be fired clear to fire the gun-cotton charges,
by exploded by means of fulminate of
exploded by means of fulminate of
mercury. As a rule electrical firing is
relled on, determined either by contact of an invading vessel or by
mines, which are fired by the pressing
cables connected to an observing of a button at the observed moment. In any case advantage lies with the defender, and the operations are very valuable in the case of countries with weak navies. The Lake type of submarine boat promises to be useful against them. Drifting wines have been used, but are either party as soon as either party as soon as nemace to ordinary maritime commerce, as they may drift far afield.

Submarine In the first trial submersion of a boat he had invented. The Rov. G. W. Garrett in 1876 performed successfully with a small model at Liverpool, and built a larger boat driven by full against them. Drifting wines have been used, but are this was lost off the Welsh in conjunction with Nordonis lost, and in addition they are menace to ordinary maritime commerce, as they may drift far afield.

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reliable practical attempt at S. N. appears to have been in the early part of the 17th century, when a Dutchman, Cornelius Probbell, successfully navigated a boat, manned by twelve rowers, in the Thames. An interesting part of the invention was a fluid which would restore the 'vital parts' to vitiated air. inventor, Day, lost his life in a vessel intended to remain under water for twelve hours in 1774, in Plymouth Sound. To Bushnell, an American, belongs the honour of undoubted success: his boat was fitted with two oars on the principle of the screw,' a rudder at the stern, a valve to admit water for sinking the vessel, force pumps for driving it out again, and pumps for attaching explosives to the bottoms of vessels. His ship was tried in 1775. In 1800 Robert Fulton, of steamship fame, made tests with an egg-shaped boat in the Scine and off Brest, remaining four hours under water, to a depth of 25 ft. He attached a torpedo to the bottom of an old hulk and blew her up. preseed air was used in this vessel. 1859 Mr. Delaney, another American, devised a similar vessel, and an American shoemaker, Philand an American shoemaker, Philips, is said to have spent a day at the bottom of Lake Michigan with his wife and family in 1851. A German, Bauer, experimented with a boat in 1830, which was lost, but recovered later, and is now in the Berlin Naval Museum; he also carried on experiments for the Russians during the Crimean War. About the same time Scott-Russell, builder of the Great Eastern, built a boat manned by twelve rowers in diving suits. In 1863 both Federals and Confederates tried submarine boats, the latter building the David, screw-propelled and steam driven, but fighting 'awash.' It was armed with a spar torpedo and carried out an unsuccessful attack on an ironclad. Another David, a true submarine, was built, and sank the Hausatonic, though the spar torpedo was carried again in the 'awash' position; this boat was swamped in position; this boat was swamped the manœuvre and was lost with her crew. In 1866 Herr Flack lost his life in Valparaiso Bay, with seven others,



A large one sold to Russia was built at Barrow-in-Furness, came round to the Solent, but was wrecked on the journey to St. Petersburg. These were all fitted with vertical screws. Mr. J. F. Waddington of Liverpool constructed a boat with horizontal rudders, driven by motors regulated by a pendulum for keeping the boat level.

M. Goubet (1885) built a successful submarine boat, and four others were in use in 1897 in the French navy; these were electrically pro-pelled and fitted with compressed air reservoirs. In 1888 the Gymnole, designed by M. Gustave Zédé after the idea of M. Dupay de Lome, was built; the outcome of the trials was the building of the Gustave Zédé, 1898, 160 ft. long, 270 tons, with electric motors developing 360 h.p., which was very successful in actual manageuvres. This was followed by the Mose and the Farfardel type, improvements on the Gustave Zedé, and the Narval. The last named is and the Narral. The last nar oil-driven on the surface, with electric 1 work. The lates tons. Another after its inventor, and launched at Cadiz, was very successful.



British submarines have followed the inventions of J. P. Holland, an American inventor. The No. 7, after designs submitted in 1895 to the U.S. government, was 85 ft. long, with a displacement of 100 tons, but not completed; No. 8, 75 tons, contained improvements. Others were built in 1896 and 1901, and designs were purchased by the British government, five boats being built by Messrs. Vickers, Ltd. These were of 120 tons, 61 ft. long, 12 ft. wide, oll torpedo tube forward. The A class, an improved type, have conning towers and periscopes, 200 tons displacement, surface speed 12 knots, submerged 7 to 9 knots. The B class, 314 tons, are capable of voyaging 2000 m. on the surface, 150 m. below. Other classes have been built—the E, \$10 tons. The change in shape has tended to a raising of the back with increased comfort. Four torpedo tubes are carried, and two 3-in. quickfiring guns.

In America, the *Hollands* have loss insured against can be or has been similarly improved, but other types are in use. The *Lake* type, named after the inventor Simon Land, is one of the great secular movehamed after the inventor simon Lake, contain an air-lock through which divers may emerge. Argonaud probably by the contraction of the Larth's crust, caused which divers may emerge. Argonaud probably by the contraction of the carries a gas engine and propeller, pression is afforded by submerged dynamo, search-light, and pumps forests, flords, coral islands, and by dynamo, scarch-light, and propeller, dynamo, scarch-light, and pumps for air and water; it travels on the bottom on wheels, and promises to be useful in discovering mines and their cables. These vessels have been adopted by Russia. Germany started with the discovering the started with the started with the started with the started water than the started with the started with the started water than the started w with Hollands, which they have developed along their own lines. The submarine boat is found in all navies now, and has become quite an efficient craft; displacements of 1000 tons are looked forward to, and speeds as well as radius of action shown great improvement. The Diesel engine has been largely responsible for this. In manœuvres the craft have come up to expecta-

actual war has been obtained yet.

See Burgoyne, Submarine Navigation, 1903; Pesce, La Navigation sous-marine, 1906; Fyfe, Submarine Warfare, Past and Present, 1907; Sucter, The Evolution of the Submarine Bout, Mine, and Torpedo, 1907; Field, The Story of the Submarine, 1908; Corbin, The Romance of Submarine Engineering, 1913.

Submarillary Glands, a pair of

Submaxillary Glands, a pair of salivary glands situated far back sanvary gands structed har back beneath the lower jaw on each side. Each gland is about the size of a walnut, and di-charges its secretion by the submaxillary or Wharton's duct opening on the sublingual papilla on the floor of the mouth.

Subpena, the name of the writ for calling a witness to hear evidence (subpena ad testificandum). It is only applied for where it is feared the supposed witness will not voluntarily come forward or is actively hostile to the party calling him. The writ for mentary evidence is called a subpana are benefited.

driven (190 h.p.) on the surface, duco lecum. The name is derived from electrically when submerged; surface the dominant word in these writs speed 8 knots, submerged 5 knots. The armanent consisted of a single centum librorum (i.e. under penalty of terrords table forward. The armanent word is supplementation of the surface of the substitute of the supplementation of the surface £100 if he neglects to do so).

Subrogation. The principle of S. in insurance is a deduction from the well-established rule that a contract of insurance of property is no more than a contract of indemnity. The principle as stated in the leading case Castellain v. Preston is that as between the insurer and the insured. the former is entitled to the advantage of every right or remedy legal or equitable of the latter, by the exer cise of which rights and remedies the

the disappearance of human construction. Submerged forests occur at several places on the English coasts and in Holland and N. France. Fiords of Norway and the firths of Scotland are evidence of submerged valleys. On the coast of Dalmatia, Roman roads and villas are reputed to be visible below the sea. In S. Sweden streets are submerged, and on the coast of Greenland a space of more

than 600 m. is perceptibly sinking.
Subsidies: 1. Taxes in aid, as the S. formerly granted to the kings of England. S. were a tax imposed not immediately on property, but upon the craft have come up to expectation completely, but no experience in actual war has been obtained yet.

See Burgoyne, Submarine Navigation, 1903: Pesce, La Navigation or personalty. On the abolition of S. a land tax was substituted. 2. A sum of money paid by one state to another under the terms of a treaty, to purchase the service of auxiliary troops, or to acquire the aid of a foreign state in a war against an enemy. Thus Great Britain paid S. to Austria and Prussia to engage them to resist the progress of the French in the Seven Years' War.

Subsoil, the layer of soil which usually occurs under the true soil; it sometimes extends downwards to a great depth, but in a hilly or rocky district is frequently absent alto-gether. It is always lighter in colour than the true soil and is lacking in organic material, though it often contains plant food which has been washed down. As a rule there is little or no advantage in incorporating any of the S. with the layer above, but calling upon any person to bring to if it is broken up by deep digging or court books, deeds, or other docu- by the S. plough, deep-rooting plants

metaphysics. S. is correlative with Quality or Attribute. Every S. must have attributes, and every attribute must be the attribute of S. But as every power or property of a thing, every way that the of a time, every way that the thing affects us, may be called an attribute or a quality, then if all the attributes are counted off there is nothing left. To avoid this seeming inconsistency, it was assumed that everything possesses besides its attributes an unknown substratum, that they rest upon, or inhere in, a mystical inscrutable bond, that holds the attributes together, without being in itself an attribute. assumption was repudiated by Locke assumption was repudiated by Locke and others, who found a meaning for S. without departing from the knowable. Every object has some fundamental or essential quality, which being present preserves its identity, and which, being removed, it is no longer the same S. but another. Thus the S. of matter is not the remnant after all the qualities are subtracted; it is the two fundamental qualities, Extension and Resistance. So long as these are found in any degree we may vary size, shape, odour, colour, etc., and yet we have matter. So the S. of Mind is whatever we regard as its fundamental essence. Feeling, Volition, or Intellect, or a composition of tion, or intellect, or a composition of all three, may be adopted according as we define Mind. Then these would be Mind, not would inhere in Mind. Notwithstanding the obviousness of this explanation, the employment of the words S. and Attribute has led to a demand for something underlying all attributes—a S, of body and a S of mind something distinct. and a S. of mind, something distinct from anything meant by the names. So many philosophers have preserved the phantom as a thing of belief, if not of knowledge. The doctrine of an unknowable S. in the abstract very early allied itself with the theory of the perception of a material world. Other names for this contrast are noumenon and phenomenon. The latter is what shows itself to our senses or is conceived by our intelligence—the qualities of extension and resistance in matter, and of feeling, etc., in mind. The noumenon is something apart and beyond, incon-ceivable and unknowable, but which, it is affirmed, we are instinctively led to believe in. See DESCARTES, LOCKE, BERKELEY, HUME, and KANT. Substitution. In Roman law no man

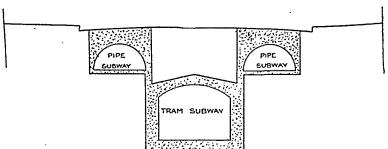
Substitution. In Roman law no man could 'institute' or name an heir to list own heir who was past pupillarity (minority), so that substituted heirs or Ss. could only take effect as conditional institutions; i.e. the sub-wonderful engineering

Substance, a word connected with stitution could only succeed in the rtain discussions in logic and exemt of the institute proving unchaphysics. S. is correlative with willing to take up his inheritance, and tributes, and every attribute of some the attributes, and every attribute of some the substitute a right as her of property is on at what time soever the institute are counted off there is conditional institutions.

conditional institutions. Subways. Many large cities are now adopting the system of constructing S. under the footways of streets to be used for telegraph wires, electric light and power cables, gas, water, and other pipes. These S. are so constructed that there is room for a man to walk and work in, while at intervals inspection entrances are constructed, thus removing the necessity of breaking up the foot-ways when it becomes necessary to repair the pipes underneath. has adopted this system, and in some of the more recent streets of London there is a passage or S. under the footway, notably Kingsway, Queen Victoria Street, and the Thames Embankment. The latter is 9 ft. wide and 7 ft. 3 in. high. The provision of these S. is of great benefit to the companies whose cables are in them. as it enables them to examine the whole length of their pipes instead of portions only, giving at the same time greater facilities for repairs without obstructing the vehicular and pedestrian traffic. S. have also become a great feature in the under-ground system of railways, connect-ing different tube railways together, e.g. the S. connecting the Great Northern Railway station at King's Cross with that of the Metropolitan District Railway station at corner of Gray's Inn Road, and those connecting the King's Cross station on the City and South London Railway with St. Paneras station, or that now under construction between Charing Cross of the Hampstead Tube and the District Railway station. Another very important and effective feature is the construction of S. at the junction of some of the important thoroughfares of our large cities to avoid the congestion of pedestrian traffic at these points and lessen the danger to life. Such S. have been constructed at the corner of Queen Victoria Street, New Bridge Street, and the Thomes Embankment; also at the end of Parliament Street, and across the Broadway at Hammersmith, the two latter having lavatory accommodation attached to them. There can be no doubt as to the value of these S. The S. at the Mansion House is one of the most

of the streets on the surface. of the roof being constructed of of Rome, professing the popish brick arches and the other of steel troughing. The Thames has been Succession Wars were of frequent tunnelled four times for the con-occurrence in Europe, between the

London. There is a collection of S., 1707, and 1709. The Act of Settle-really in fact the underground replical ment (1) declares that if a Papist The obtains the crown, the subjects of the new Kingsway has, in addition to its realm are thereby absolved of their pipe S., a tram S., extending along the allegiance; (2) settled the crown whole length and joining the Thames on the Electress Sophia and the Embankment under Waterloo Bridge. Protestant heirs of her body; and This S. varies in width, but is about (3) expressly excludes all persons 20 ft. wide and 13 ft. high, one part holding communion with the Church



Tunnel and the Rotherhithe Tunnel; of the failure of a sovereign house and twice for foot passengers, at the Tower and at Greenwich. The those of the Orleans succession to the Tower S., now in disuse as a foot S., is 7 ft. in diameter, and was constructed in 1869-70 at a cost of about Succession (1700-13); of the Spanish £10,000. Blackwall Tunnel, 25 ft. in diameter, was constructed in 1892-97, pace of Vienna; of the Austrian Succession (1710-48); and of the Barunel, 28 ft. in diameter, was constructed in 1908. The Greenwich S. is ridicule, the Potato-war. See Austria and Spain (History).

Succession (1740-48); and of the Barunel, 28 ft. in diameter; it was constructed in 1908. The Greenwich S. is ridicule, the Potato-war. See Austria and Spain (History).

Succession (2140-48); and of the Barunel, 28 ft. in diameter; it was constructed in 1908. The Greenwich S. is ridicule, the Potato-war. See Austria and Spain (History).

Succession (2140-48); a dibasic in 1902 at a cost of about £30,000.

In 1902 at a cost of about £30,000.

Succession. The law of S. is that according to which the S. to the property of deceased individuals is regulated. This may be (a) in cases where a deceased party has died from ethyl acetoacetate or ethyl intestate, when the order of S. is according to fixed rules for the most part based on the canon law (see Distribution, Statutes of; Inheritance; and Primogeniture).

(b) According to a settlement (a.v.) by deed, will, or other instrument, under which land or any interest in land, or other property stands for the to or in trust for any persons by way of S.

Succession, Apostolic, see Apos-

the crown of Great Britain is settled food. by the Act of Settlement, 1701, con-firmed, as to the Protestant succes-on a group of islands E. of Lake slon, by Acts passed in 1702, 1706, Tai-hu, 56 m. W.N.W. of Shanghai,

struction of public S., two for middle of the 17th and the middle of vehicular traffic, viz. the Blackwall the 18th centuries, on the occasion Tunnel and the Rotherhithe Tunnel; of the failure of a sovereign house.

Succinic Acid (C.H.O.), a dibasic

land, or other property stands for the have developed fleshy parts owing time being limited (see LIMITATION) to the storage of food in them. Thus to or in trust for any persons by way the cast store food in thick stores. the cacti store food in thick stems, the leaves of which are reduced to scales or thorns, and in many other TOLIC SUCCESSION. plants, e.g. the aloe and agave, the Succession Acts. The succession to leaves are fleshy and packed with

in the prov. of Kiang-su, China. Bolivia. city is noted also for its cheap resplendid city in the middle ages, Suchow is still suffering from the effects of its demolition at the hands of the Taipings in 1860. Pop. 500,000.

féra (1772-1826), marshal of France; covered himself with glory during the covered himself with grory during the Napoleonic campaigns. At the siege of Toulon (1793) he took General O'Hara prisoner. As commander of the left wing of Masséna's army, he repelled the Austrian troops under Melas (1800) and so saved France from a southern invasion. Having assisted in securing the capitulation of Saragossa, he was made generalis-simo of the army of Aragon (1809). and in two years completely pacified that province. In 1810 he defeated the Spanish general, O'Donnell, and captured Lerida; two years later he crushed Blake's army and became master of Sagunto and Valencia.

Suck, a trib. of the Irish Shannon, into which it flows, 8 m. S.E. of Ballinasloe. It is a boundary between Roscommon and Galway.

Length 60 m.

Sucker, the term applied in botany to an aerial branch given off by an underground stem. It runs for a short distance under the soil, then pushes upwards to form a new plant. Examples are the rose and mint.

Sucking-fish, a term applied to all members of the acanthopterygian family Echeneididæ, the Remoras, in the division Discocephali, on account of the suctorial oval disc they bear on the upper part of the head. By means of this disc they attach them-selves to large floating objects, such as ships, or swift-swimming animals, as sharks, and they are to be found in all seas. Other S. are the suckers, which form the family Gobiescoide, and the lumpsuckers, which form the Cyclopteridæ.

Suckling, Sir John (1609-42), an English poet, born at Whitton, Middlesex. He inherited an ample Middlesex. He inherited an ample fortune on the death of his father in 1627, and travelled abroad. On his return in 1630 he was knighted. Some of his shorter pieces are incomparable for charm and daintiness, parable for charm and the songs such as Constancy, and the songs I prilhee send me back my heart, and Why so pale and wan, fond and Why so pale and wan, fond lover? His works were collected posthumously in Fragmenta Aurea (1646). There is a biography by Alfred Suckling (1836).

Sucre, or Chuquisaca (Indian for golden bridge'), a tn., 8839 ft. GAL NIGERIA, above the sea and 48 m. N.E. of AFRICA. BELGIAN CONGO, etc.), there-Potosi, in the dept. of Chuquisaca, fore only the eastern portion, the

Its halls of congress and There are 7000 silk looms, and the president's palace remind the incity is noted also for its cheap re- habitants that their city was once city is noted also for its cheap reprints of Chinese classics. A vast and splendid city in the middle ages, bishopric since 1552 and the seat of Suchow is still suffering from the effects of its demolition at the hands of the Taipings in 1860. Pop. 500,000. Charcas since 1609, it possesses a cathedral dating back to 1553. The Suchet, Louis Gabriel, Duc d'Albuin 1624. In the vicinity are orchards and vineyards. Pop. 23,500.

Sucrose, sec SUGAR. Suction Gas Plants sec GAS MANU-FACTURE—Gas for fuel or power.

Suctorial Crustaceans are those belonging to the group Rhizocephala, They are parasitic on other crusta-ceans, and many of them obtain their nutriment from crabs.

Suczawa, a tn. of Bukowina, Austria, on the Roumanian frontier, It was the former residence of the Moldavian princes, and it carries on fancy leather industries. Pop. 11,539.
Sudamina, or Miliary Eruption, an eruption of whitish vesicles due to disturbance of the functions of sweatglands in the course of most fevers. It is non-inflammatory and not dangerous, consisting of a collection of sweat in the ducts of the sweat-

glands. Sudan, or Soudan, formerly the name of a vast tract of equatorial Africa lying S. of the Sahara Desert and Egypt, and stretching from Cape on the E. It extended S. to the Congo basin and the equatorial lakes, with Abyssinia and British E. Africa form ing its E. boundary. It was also known as Negritia, or Bilad-es-S., 'the Land of the Blacks,' Later it was divided into three geographical portions: French S. on the W., Central S. and the Angio-Egyptian S. on the E. The S. included Senegal, the Fulah country, portions of French Congo (now French Equatorial Africa), the Guinea Coast (now split up into of the various Congo **Jelgian** Congo), Nadai. Kanem. other minor states. The French have extended their possessions by ex-ploration and military occupation from the W. coast eastwards beyond Lake Chad to the confines of Wadni in Central S., and southwards to the Ubangi and Congo rivers. As the various regions lying within the western half and southern portions

concerning the-

colonies, see ti

of the S. have, by a series of inter-national conventions and treaties, been delimitated (for further details

on the S.E. by Italian Eritrea and Abyssinia, whose frontiers have been recently demarcated. The area is computed at 984,500 sq. m., and the pop. is estimated at 3,000,000. The Nile traverses the region from N. to S., with a large ben_ westwards about lat. 20° N., enclosing part of the Nubian Desert, which extends to the Red Sea coast. The Libyan Desert lies to the immediate W. Where the Nile enters the Anglo-Egyptian S., it is known as the Bahr-el-Abiad (or White Nile).

the waters of Sobat rivers. the Bahr-el-Azrek (or Blue Nile), an important affluent flowing N.W. from Abyssinia; henceforth it flows on as the Nile, taking in the Atbara below Berber. Between Wady Halfa and Khartum there are several cataracts and rapids which impede navigation. Along the shore of the Red Sea, running almost parallel to it, is an extensive range of mountains, which attain their highest elevations in Jebel Erba (7480 ft.) and Jebel Soturba (6889 ft.). The chief ports along a coast-line of nearly 400 m. are Port Sudan and Suakin (q.v.). S.E. of Khartum is Kordofan, a plateau of some 2000 ft. clevation, while further W. is Darfur, clevation, while further W. is Darfur, with heights exceeding 6000 ft. The most fertile regions are those lying W. and S. of Khartum, watered by the Atbara and the Blue and White Niles. Here there are large areas under durra (native food), millet, sesame, and pulse, which might advantageously be planted with cotton and wheat. Cotton plantations have been successfully laid out in the been successfully laid out in the Tokar district, as well as near Don-gola, where the completion of irriga-tion works has enabled the land to be brought under cultivation. On the banks of the White Nile the soil is not so fayourable, but in the forests near by the gum acacia, ebony tree, the rubber creeper, and the bamboo are found. The upper reaches of the Blue Nile flow through dense forests which extend as far as Abyssinia; here valuable fibres and tanning materials abound. In the Bahr-el-Ghazal district the finest rubber is yielded, while Kordofan has forests containing gum trees in great abundance. N. of Khartum the country is mainly desert, save for narrow strips of cultivated land on the banks of the Nile.

Anglo-Egyptian S., will be dealt with here. This region lies S. of Egypt and extends southwards to Uganda and the Belgian Congo, in lat. 5° N., a list of about 1300 m., and from Wadai in the W. to the Red Sea in the E., about 1200 m. It is bounded tum was opened in 1899, and a branch the E., about 1200 m. Eitse and limited Ber Sydan was opened in 1899, and a branch tum was opened in 1899. line to Port Sudan was opened in 1896. From Khartum the line was extended to El Obeid, and further branches and extensions are in course of construction: the total mileage open is over 1500 m. Government passenger and cargo steamers ply the Nile, and regular services are established over 2250 m.

The chief products are ivory, gum, gold, ostrich feathers, cotton, ccreals, and dates; coal, clothing, machinery. and railway plants are imported. Ĭń £1,234,749, and the exports were valued at £910,771.

The northern part of the Anglo-Egyptian S. contains many interesting antiquities, notably the rock-hewn temple at Abu Simbel and the pyramids and temples near Wady Archæologists are still working in these districts, and are every year bringing to light ancient Egyptian works of art and inscribed relics which, when pieced together and translated, may throw much light on the ancient history of the country. The Anglo-Egyptian S. is each administered by a governor with subordinates, controlled by a governor-general, who is assisted by a council. Instruction is carried out by a comprehensive educational system; there are elementary, primary, or secondary schools in all the principal towns—the Gordon colleges at Khartum and Omdurman being the chief educational establishments.

It was formerly under the domination of Egypt, whose rule was severely checked by the revolt of the Mahdi in 1882. His successor, the Khalifa, held his own for nearly sixteen years. desolating the country far and wide. grinding the people under the heel of oppression. However, in 1898 the forces of the Khalifa were annihilated and he himself slain at the battle of Omdurman by the British and Egyptian forces under the com-mand of Lord Kitchener. Thereafter the country came under Egyptian rule. It has not It has not yet recovered from the devastating effects of the Dervish tyranny, whole districts having been depopulated; but now there is every sign that the country has before it a prosperous future, towards which it will be led by a wise and careful administration. The chief towns are: Khartum (pop. See Wallis Budge, The Egyptian

Sudan, 1907; Slatin Pasha, Fire and triumphed over virtue. In 1840 S. Sword in the Sudan. 1896; Lord resolved to try the virtuous novel, Cromer, Modern Egypt, 1908; and article by F. R. Cane, Ency. Brit., 11th ed.

Sudbury: 1. A market tn. and municipal bor. of Suffolk, England, on the Stour, 59 m. N.E. of London and 16 m. S. of Bury St. Edmunds. There are flour-mills, malt, lime, brick, and tile works. Pop. (1911) 7141. 2. A tn. of Ontario, Canada, in the dist. of Nipissing, 60 m. N.W. of Lake Nipissing. There are considerable deposits of copper ore, etc. Pop. 4500.

as of aquatic over large

It forms an almost impenetrable obstruction to navigation, but is believed to be likely to pay for its removal by being be dried and compressed into briquettes for fuel, which is particularly scarce and expensive in the district. Ex-periments in this connection have been in progress since 1910.

Sudermann, Hermann (b. 1857), a German novelist and dramatist, born at Matziken, E. Prussia; educated at Königsberg and Berlin; became editor of Deutsches Reichsblatt, 1881. editor of Deutsches Reichsblatt, 1881. His works (published in England by John Lane) include the novels: Frau Sorge, 1887; Katzensteg, 1889; Es War, 1894; Das hohe Lied, 1908 (Eng. trans. by B. Marshall, 1913); and the dramas: Die Ehre, 1890; Sodom's Ende, 1891; Heimal, 1893; Jas Glück im Winkel, 1896; Die drei Beibertedem, 1899: Johannisteuer. Reiherferdern, 1899; Johannisfeuer, 1900; Das Blumenbeet, 1905; and Der Bettler von Syrakus, 1911.

Sudetic Mountains, a mountain system of S.E. Germany, which extends from the Biczwa basin in Moravia to the Saxony and Bohemia borders. The principal divisions are the Riesengebirge, Isergebirge, Glatzer, Adler-gebirge, Eulengebirge, etc.

Sudorifics, see DIAPHORETICS.

Súdras, see CASTE.

Sudsha, see Suja.

Sue. Joseph Marie (1804-59), a French novelist, known as Eugene S., born at Paris. S. belonged to a family of distinguished physicians, and originally studied the family profession, but soon gave it up for a military career. After pursuing his adventures both by land and sea for number of years, he returned to Paris in 1831, and the same year his novels Plick et Plock and Alar Gull were published. In 1835-37 his con-spicuous failure, L'Histoire de la Marine François we vublished. Marine Française, was published, which provoked the waggish jocularity of some officers of Toulon. Numerous romances followed this historical attempt, in which vice Mediterranean and the Red Sea. Such

which had amazing success. One of the great literary events of Louis Philippe's reign is described in his Mathida (1841), which was followed by Les Mystères de Paris (1842), Le Juif Errant (1844-45), Martin l'Enfant Trouve (1847), and Les Sept Philippe (1847), and Les Sept Philippe (1847), and Les Sept Philippe (1847). fant Trouve (1847), and L Péchés Capitaux (1847-49). The Mysteres du Peuple (1849-56) was suppressed in 1857. In 1848 S., who was an extreme Socialist, was elected Nationale; but on the election of Napoleon III. he was expelled from the French territory, and retired to Annecy.

Sueca, a tn. in the prov. of Valencia. Spain, in an orchard- and grain-growing dist., 20 m. S. of the city of Valencia. Pop. 14,500.

Suet, the solid fat obtained from the abdomens of cattle and sheep. It is largely used in cooking and also in the production of tallow by rendering down. As an emollient it is utilised in ointments and other medicinal preparations.

Suetonius, Gaius Suetonius Tranquillus (c. 75-160 A.D.), a Latin historian, grammarian, and critic, born at Rome, the son of a Roman officer; became an advocate and later magister epistolarum to the Emperor Hadrian. His Vilæ Duodecim Cæsarum is almost complete. A translation is in Bohn's Classical Library.

Sueur, Eustache Le (1617-55), a French painter and sculptor, born at Paris; studied under Vouct. His works include 'Scenes from the Life of St. Bruno,' 'St. Paul healing the Sick before Nero,' 'St. Paul preaching at Ephesus,' etc.

Suevi (modern Strabians), a Germanic people, said by Cæsar to Inhabit Baden, and by Tacitus a region to the N. and E. of this.

Suez, a seaport in. of Egypt, at head of Gulf of Suez and W. of the mouth of the Suez Canal, 76 m. E. of Cairo. Port Ibrahim, 2 m. S. of Suez, is a fine harbour at the entrance to the Canal. The town, which is surrounded by desert, is unattractive in appearance, but is clean and has a good climate. Pop. 19,000.
Suez, Gulf of, the W, arm of the Red Sea after its bifurcation in lat. 28° N.,

whence it extends N.W. for 190 m. to lat. 30° N. Average breadth. 30 m. Suez, Isthmus of, the neck of land connecting Asia and Africa, having S. the Gulf of Suez and N. the Mediterranean, and through which is cut the Suez Canal (q.v.). Minimum width, 72 m.

Suez Canal, a waterway cut through the Isthmus of Suez to connect the

a canal seems to have been constructed in the time of Seti I. (1380 B.C.), and is referred to in inscriptions in the temple of Karnak, and frequent projects were entertained during ancient and mediæval times. The first serious steps towards the modern canal were taken by Napoleon in 1798, and in 1846 the Société d'Etudes pour le Canal de Suez was formed by Prosper Enfantin. Little progress was made till, in 1854, Ferdinand de Lessens came forward and constituted the Compagnie Universelle du Canal the Compagnic Universelle du Canal Maritime de Suez, and drew up a scheme in concert with two French engineers, Linant and Mougel. This was passed by the International Commission with a few alterations, and the work was begun in 1856. The canal was opened for working in November 1869. The total expenditions of the generaty was 432 807 809 ture of the company was 432,807,822 francs. The canal was enlarged and improved in 1885-89, the depth finally being 9 metres, and the minimum width in straight parts from 65 to 75 metres, according to location, and on curves 80 metres. The canal runs from Port Said along the edge of Lake Menzala, through the Bala Lakes, Lake Timsa, and the Great and Little Bitter Lakes to Port The total length is 87 m., Ibrahim. of which 21 m. are in lakes. It can be used by the largest vessels, and the average time of transit is about sixteen hours. A freshwater canal runs from the Nile to Lake Timsa, with branches parallel to the maritime canal. The dues paid by vessels are being lowered on a sliding scale, and in 1906 were 71 francs per ton, and 10 francs per head for passengers. In 1911, 4969 vessels, with a net tonnage of 18,324,794, passed through. The receipts were £5,522,000, and 275,259 passengers were carried. For diagram of the canal, see Everyman's Historical

Atlas of Asia. Sufficient, the name of hot sulphurous exhalations, common in the region of

volcanoes.

Sufficai

Suffocation, sec ASPHYXIA

Suffolk, an E. co. of England, bounded N. by Norfolk, S. by Essex, E. by the North Sea, and W. by Cam-bridgeshire. The coast-line is generally low and regular, and has in places been much encroached on by the sea, the original port of Dunwich having entirely disappeared. The principal openings are formed by the estuaries of the Deben, the Orwell, and the Stour. On the coast are several well-known watering-places, including Lowestoft, Southwold, Aldeburgh, and Felixstowe. The surface of the county is low and undu-lating; in the N.W. there is a small tract of Fen country and a range of bishops.

low chalk hills (352 ft.), while in the N.E. there are broads as in Norfolk (q,v), and in the N.W. a tract of heath land known as the Breckland district. The chief rivers, besides the three mentioned above, are the Waveney, Blythe, Alde (or Ore), and the Lark. Nearly the whole county is under cultivation, the soil being extremely fertile. Barley, oats, and wheat are all grown extensively, and farming is in a very flourishing condition. Cattle, sheep, pigs, and poultry are reared, and a breed of horses used for agricultural purposes known as the Suffolk Punches. The coast fisheries are important, Lowestoft is the centre, heirings and mackerel forming the chief catch. se connected

implements (for which ig the chief: there are also chemical and guncotton factories, and silk, cotton, linen, woollen, horse-hair and cocoanut matting works. The chief ports are Lowestoft, Aldeburgh, Woodbridge, and Ipswich. Communication is good. The county is divided into two divisions for administrative purposes, contains twenty-one hundreds. and five parliamentary divisions, each returning one member. S. formed part of the kingdom of E. Anglia. Walton was the scene of the landing of the Earl of Leicester in 1173, when he marched against Henry II., and later of Queen Isabella and Mortimer. Mary raised an army in the county, and during the Civil War it was a stronghold of the parliament. There are also numerous churches, remarkable for their decorative work in flint and for their round towers, those of Little Saxham, Herringfleet, Blythburgh, Layenham, and Long Melford being perhaps the finest. The ancient castles of Bigod, Framlingham, and Orford also deserve mention. Area 1455 sq. m. Pop. (1911) 382,748. See story and Anti-16-48), and Vic-: Suffolk.

Suffolk, a tn. of Virginia, U.S.A., in Nansemond, 75 m. S.E. by S. of Richmond. Pop. (1910) 7008.
Suffolk, Charles Brandon, Duke of Charles Brandon, On William of William (1484-1545), the son of William Brandon, and was brought up at the court of Henry VII., with whom he was a great favourite. He distinguished himself in the French campaign in 1513, was created Viscount Lisle in that year, and Duke of Suffolk a year later. On the occasion of Mary Tudor's marriage he took part in the jousts.

Suffragan, see BISHOP—Suffragan

Suffren de Saint Tropez, Pierre André | ties in other fruits. The sugar of comde (1726-88), a French admiral, was born at Saint-Caunal, Provence, France, and entered the French navy in 1743. He was twice captured by the English, and was made captain in 1772. After serving in Malta, he fought five indecisive battles against the English under Admiral Hughes in 1782 and 1783. He returned to France at the conclusion of the treaty of Versailles, and was created a viceadmiral.

Suffism (probably from Arabic suf, wool, the fabric of the plain garments enjoined by Islam), originally a Persian revolt against Mohammedan ritual; it became a distinct religious movement in its final mystico-pantheistic form, of which the greatest exponent was Zoroaster. S. interprets God, the one Being, as infinite moral good and eternal esthetic beauty, the ecstatic love for whom shall relieve the soul of the pain of human desires. To attain to this ecstasy, S. demands implicit obedience to, and utter con-centration of the mind emotionally and intellectually on, the Divine Being. Although often associated with Buddhism (which denies the soul and the Supreme Being, and seeks coma instead of ecstasy) and with Christianity, it is probable that the strongest external influence which has affected S. is Neo-Platonism; but in the main it was a purely internal and national reaction, analogous in a way to Christian mysticism of the middle ages. S. has coloured almost the whole of Persian literature; the hedonistic writings of Hafiz, Sadi, and Omar are generally accepted as symbolical of suffistic ideals. See various vols. in Murray's Wisdom of the East Series, also Vaughan's Persian Mystics in the Middle Ages, 1856.

Sugar, the name used to describe a number of sweet-tasting aldehyde or ketonic alcohols. The sugars constitute a large section of the carbobut due a large section of the carbo-hydrates and may be classed into two groups: (1) Monoses (molecular formula C₈H₁₆O₆); (2) Bioses (mole-cular formula C₁₈H₂₉O₁₁). The former are not decomposed by dilute acids, but the latter are readily hydrolysed, yielding two molecules of the same or different monoses. Glucose (dextrose or grape sugar), mannose, galactose, and fructose (levulose) are monoses, while sucrose (cane sugar), maltose, and lactose are bioses. In this article sucrose alone will be considered, the other sugars being described under fructose, galactose, etc. Cane sugar, saccharose, or sucrose (C12H2O11) occurs in large quantities in the ripe sugar cane (20 per cent.) and in beet-diacem. Sugar was first extracted root (16 per cent.), in smaller quantifrom the beet in 1747 by Marggraf.

merce is manufactured from the sugar cane and from beetroot, the processes of extraction being more or less similar. The material is crushed between hydraulic presses and the expressed juice boiled with 1 per cent, of milk of lime to neutralise acids present and to prevent fermentation. (With beet, the material is sliced and treated with hot water and the solution boiled with lime.) The solution is treated with carbon dioxide to precipitate excess of lime, decolorised as much as possible by boiling with animal charcoal, and then filtered. Evaporation under reduced pressure by steam then follows, until the syrup deposits crystals on cooling. The crystals are separated from the brownish coloured mother - liquor (molasses or treacle) by centrifugals, and are purified by recrystallisation from water. The syrup still contains about 50 per cent. of sucrose which will not crystallise, but is extracted by adding strontium hydroxide. Strontium sucrate is deposited, and the precipitate is collected, suspended in water and decomposed by passing in carbon dioxide. The filtrate is in carbon dioxide. The filtrate is evaporated to a syrup which yields crystals of sugar. Cane sugar crystalises from water in large four-sided prisms (sugar candy). It is very soluble in water (three parts of sugar dissolve in one part of water at ordinary temperatures), but is insoluble in alcohol. It melts at 160° C., solidifying on cooling to a pale vellow glassy mass called barley sugar. At about 200-210° C. sucrose loses water, and is converted into a brown mass called caramel which is used for mass cannot caranter which is used for colouring soups and gravies, etc. Sucrose does not reduce Feliling's solution; it is charred by sulphuric acid, forming a carbonaceous mass which is distended by the steam, carbon and sulphur dioxides being evolved. On then treating with a princed acid current is hydrolyten. mineral acid, sucrose is hydrolysed (inverted) to a mixture of glucose and fructose. Solution of sucrose is and tructose. Solution of sucrose is dextro-rotatory, while after hydrolysis the solution is levo-rotatory, hence the term 'inversion' of sugar. The mixture of glucose and fructose is called 'invert sugar,' and is used in the manufacture of preserves, etc. The annual production of cane sugar is about nine to ten million terms. tons.

Sugar Beet, a very important sugaryielding field crop, derived, like the mangold, by selection and by sys-tematic breeding from the sea beet (Beta maritima), a common perennial on muddy sea shores (order Chenopoextraction of the sugar was built near Breslau in 1799 by Achard; and Napoleon, a few years later, encouraged and expanded the new industry. About 5,000,000 acres are now devoted to the world's crop, but until 1910, except for spasmodic experiments, sugar was not grown in Britain. In 1912 the first modern factory was opened at Cantley, Norfolk. Experimental and educational assistance from the Development Commission promised in 1913 to establish the industry permanently, it having been demonstrated that the crop can be satisfactorily grown in Britain. See Sugar Beet by 'Home Counties'; Sugar Cane and Beet by George Martineau.

Suhl, a tn. of Schleusingen, Prussian Saxony, at foot of the Domberg, on R. Lauter, 121 m. N.E. of Meiningen. It is famous for its manuf. of arms, and has iron foundries and potteries.

Pop. 14,466. Suhm, Peter Frederick (1728-98), a Danish historian; author of Historie af Danmark (24 vols., 1782-98). The last seven vols. were published after his death by Kall and Nyerup, 1806-28.

Suicer, Johann Caspar (1620-84), a Swiss scholar and theologian, born at Zürich, and became professor of Greek and Hebrew in the University there. His chief work is Lexicon, sive Thesaurus Ecclesiasticus Patrum

Græcorum (2 vols., 1682).
Suicide. A felo de se or S. is by English law a person who, being of years of discretion and in his senses, takes his own life. The absence, real or supposed, of this last condition is now very generally assumed by coroners' juries in order to save the reputation of the deceased, to ensure Christian rites of burial, and, doubtless, to express sympathy with deceased's dependents. It is also, by English law, S. to kill oneself unintentionally in an endeavour to kill another maliciously. If two persons, as commonly happens among youthful lovers, agree to commit S. together and one escapes and the other dies, the survivor is guilty of murder.

Suides, see PiG.
Suides, a Greek lexicographer of about 10th or 11th century A.D. His lexicon is frequently quoted by Eustathius (12th-13th century). lt is an encyclopedic dictionary, with numerous literary quotations of con-siderable value, though uncritical and unequal. It was compiled from numerous writers, and it contains many passages from ancient writers who are lost.

Sui-fu, Hsüchou-fu, or Süchou-fu, three est a tn. of Süchwan, China, on Yangtse-flowing

The first factory for the commercial kiang, 130 m. S.W. of Chungking. A

great trade centre. Pop. 250,000.
Sui Juris (Lat. 'in his own right'),
a legal phrase borrowed from the Roman law of emancipation, denoting a person who, not being an infant, lunatic, married woman restrained from anticipation, or otherwise under any legal disability, is legally capable of managing his own affairs, or of suing and being sued in his own right. In the law of trusts where there is only one beneficiary interested in the trust property, and such person is sui juris, the trustee's raison d'être is gone and the beneficiary can call for a conveyance of the full legal estate.

Suir, a riv. of Ireland, rising in Tipperary, flowing S. past Thurles and Caher, and past Cloumel, Carrick, and Waterford, and uniting with the Barrow to form Waterford Harbour.

Length 100 m.

Suite, in music, was the first instru-mental form of composition, in which the combination of several parts formed a whole. It was conspicuous in the latter 16th and early 18th centuries, consisting of a series of dances. with a prelude, and maintaining a uniformity of key and rhythm.

uniformity of key and rayonm.
Suja, or Sudsha, a tn. of Kursk gov.,
Central Russia, 54 m. S.W. of Kursk,
with mills, distilleries, and numerous
manufs. Pop. 13,000.
Sukkur, or Sakkar, a tn. of dist.
Shikapur, Sindh, India, on the W.
bank of the Indus, opposite Rohri.
It is the starting point of the railway
traversing the Bolan and Nari passes traversing the Bolan and Nari passes to Quetta. Pop. 31,000.

Sulaiman, or Suleiman, Hills, a mountain range, 350 m. long, in the N.W. Provinces, India, near the Baluchistan frontier. They trend Baluchistan frontier. They trend S.W., almost following the course of the Indus. The highest summit is the Takht-i-Sulaiman, which reaches an alt. of 11,070 ft., but other peaks approximate in height. There are several important passes near the towns of Attock, Sukkur, Dera Ghazi Khan, and Dera Ismail Khan.

Suleiman Pasha (1838-92), a Turkish general. He entered the army in 1854, and became major (1867), colonel and instructor in the military school (1873), sub-director of the military school and general of brigade (1874), general of division (1876), and marshal (1877). He served in Monte-negro, Crete (1867), and Yemen; in the Servian campaign (1876); in the Russo-Turkish War, defeating Gurko at Eski-Zaghra (1877), and losing his army at the Shipka Pass. He was degraded for his defeat at Philippupolis (1878) and imprisoned. Sulina: 1. The centre one of the

three estuarine arms of the Danube. through the Dobrudia.

prov., Dobrudja, Rumania, at mouth of above. Pop. 7000.

Suliotes, an Albanian tribe who since the 17th century have lived in Yanina, Epirus. Before being driven here by the Turks they were largely settled in the Ionian Isles, and served in the wars of Greek Independence. Sulla, the name of a patrician

family of the Cornelia gens:

L. Sulla (138-78 B.C.), surnamed Felix, the Dictator. He was questor in 107, when he served under Marius in Africa, and also with great distinction in the campaigns against the Cimbri and Teutones; but Marius becoming jealous of the rising fame of his officer, S. left Marius in 102, and took a command under the colleague of Marius, Q. Catulus, who entrusted the chief management of the war to S. S. now returned to Rome. He was prætor in 93, and in the following year (92) was sent as proprætor into Cilicia, with special orders from the senate to restore Ariobarzanes to his kingdom of Capadocia, from which he had been expended in the senate to restore Ariobarzanes to his kingdom of Capadocia, from which he had been expended in the senate to restore Ariobarzanes to his kingdom of Capadocia, from which he had been expended in the senate to restore Ariobarzanes to his kingdom of Capadocia, from which he had been expended to the senate to restore the senate t padocia, from which he had been expelled by Mithridates. S. met with complete success. The enmity be-tween Marius and S. now assumed a more deadly form. S.'s ability and increasing reputation had already led the aristocratical party to look up to him as one of their leaders; and thus political animosity was added to private hatred; but the breaking out of the Social War hushed all private quarrels for the time. Marius and S. both took an active part in the war against the common foe, but the achievements of S. threw those of acmevements of S. threw those of Marius into the shade. S. gained some brilliant victories over the enemy, and took Bovianum, the chief town of the Samnites. He was elected consul for S8, and received from the senate the command of the Mithridatic War. Marius, envious at not bearing received the command of the Mithridatic War. having received the command, obtained the expulsion of S., but S. returned to Rome at the head of his legions, which resulted in the proscription of Marius and his leading S. set out for Greece at adherents. the beginning of 87, in order to carry on the war against Mithridates. After on the war against Mithridates. After driving the generals of Mithridates out of Greece, S. crossed the Hellespont, and early in 84 concluded a peace with the king of Pontus. S. now prepared to return to Italy, where, during his absence, the Marian party had obtained the ascendency. He landed at Remindration in the spring landed at Brundusium in the spring of 83. The Marian party far out-numbered him in troops, and had the Civil War S. espoused Cesar's every prospect of victory; however, cause. He served under him as in the following year (82) the struggle legate in Greece, and commanded

Length, 50 m.; width, 100 yds.; was brought to a close by the decisive depth, 15 to 60 ft. 2. Port of Tulcea victory gained by S. over the Samnites and Lucanians under Pontius Telesinus before the Colline gate of Rome. This victory was followed by the surrender of Præneste and the death of the younger Marius. S. was now master of Rome and Italy; and he resolved to take the most ample vengeance upon his enemics, and to extirpate the popular party. One of his first acts was to draw up a list of his enemies who were to be put to death, called a *Proscriptio*. S. had been appointed dictator for as long a time as he judged to be necessary, during which period he endeavoured to restore the power of the aristocracy and senate, and to diminish that of the people. At the beginning of \$1 he celebrated a splendid triumph on account of his victory over Mithridates. In order to strengthen his power, S. established military colonies throughout Italy. Twenty-three legions, or, according to another statement, forty-soven legions, re-ceived grants of land in various parts of Italy. S. likewise created at Rome a kind of bodyguard for his protection, by giving the citizenship to a great number of slaves who had belonged to persons proscribed by him.
After holding the dictatorship till the
beginning of 79, S. resigned this
office, to the surprise of all classes. He retired to his estate at Putcoli, and there died in the 60th year of his and there died in the toth year of his age. (Mommsen, History of Rome, vol. iv.; Oman, Seven Roman Statesmen.)
Faustus Sulla, son of the dictator by his fourth wife, Cacilia Metella, and a twin brother of Fausta, was born not long before 88. Faustus accompanied Pompey into Asia, and was the first who mounted the walls

was the first who mounted the walls of the Temple of Jerusalem in 63. In 54 he was questor. He married Pompey's daughter, and sided with his father-in-law in the Civil War. He was present at the battle of Pharsalia, and subsequently joined the leaders of his party in Africa. After the battle of Tharsus in 46, he attempted to escape into Mauretania, but was taken prisoner by P. Sittius and carried to Cæsar. Upon his arrival in Cæsar's camp he was murdered by the soldiers in a tumult.

P. Sulla, nephew of the dictator, was elected consul along with P. Autronius Pætus for the year 65, but neither he nor his colleague entered upon the office, as they were accused of bribery by L. Torquatus the younger, and condemned. It was currently believed that S. was privy to both of Catilino's conspiracies. In the Civil War S. espoused Cæsar's cause. He served under him us legate in Caraca and caracasta

He died in 45.
Sullivan, Sir Arthur Seymour (1842-1900), a composer of operas, son of a Kneller Hall clarinet master. Entered Chapel Royal in 1854, shortly after-wards studying at the Royal Acad-emy under Sterndale Bennett and Goss. His first important work was overture, written during student days at Leipzig (1858), where, with Franklin Taylor, Carl Rosa, and J. F. Barnett, he was a pupil at the Conservatoire; his masters included Conservatoire; his masters included Plaidy, Moscheles, and Richter. As the associate of the late Sir W. S. Gilbert, he wrote many light operas for the Savoy, e.g., H.M.S. Pinafore (1878), Pirates of Penzance (1880), Patience (1881), Iolanthe (1882), Mikado (1885), Feomen of the Guard (1888), Gondoliers (1889). The cantatas Martyr of Antioch (1880), Kenilworth (1884), and Golden Legend (1886), and his grand opera Ivanhoe (1891), must also be mentioned.

Sullivan, Barry (1821-91), an actor, of Irish birth. He appeared in Ireland

of Irish birth. He appeared in Ireland as a professional actor in 1837; in Edinburgh (1841), in Liverpool (1847), in London (1852), in America (1857), and in Australia (1861-66).

Sully, Maximilien de Bethune, Duc de (1559-1641), a French statesman, born at Rosny. In 1572 he was placed by his father, the Baron de Rosny, in the service of Henry, the young king of Navarre. His father died about 1575 and left him entirely his own master. At first Rosny accepted an ensigney in the regiment of foot of which his relation Lavardin was colonel, and in this capacity he became as remarkable for his intrecame as remarkable for his intrepidity as he was for his prudence in civil affairs. He was persuaded in 1581 to accompany the Duke of Anjou to the Notherlands; but he returned in 1583 to the king of Navarre, and was almost immediately dispatched to Paris to keep an eye upon the intrigues there going forward. In 1583 he married Anne de Courtney, and spent the whole of 1584 with his young wife at Rosny. Rosny's devotion to the cause of Henry was deep and unalterable. He was employed in many delicate and difficult negotiations; and at the battle of Coutras (1587), where he commanded the small park of artillery, he contributed mainly to the gaining of the victory. The services of Rosny, after the assasination of hydrochloric acid, and oxidisin the French king, Henry III., and until the entry of Henry IV. into Paris (March 1594), were great. He was appointed a member of the great appointed a member of the great council of finance, 1596. On receiving or soporific (dose 15-45 grains).

along with Cæsar limself the right the appointment, his first step was to wing at the battle of Pharsalia (48). obtain from the king the appointment of a commission of inquiry into the state of the revenue and its col-lection in all the districts into which the kingdom was divided for financial purposes. He was soon afterwards promoted to be superintendent of finance, and entered upon the dis-charge of his duties with a zeal that amounted almost to a passion. When he undertook the management of the finances, in 1597, the treasury was empty and in debt; after the death of Henry IV., in 1610, forty-two mil-lions of livres were found in it. His success in this department led to his appointment as grand-master of the artillery, director of the marine, master of works, and director of bridges and highways. He became in fact sole minister of France. In 1606 he was created Duc de Sully and a peer of France. The murder of Henry IV. in 1610 terminated the career of S. as minister. Early in 1611 he gave up the offices of superintendent of finance and governor of the Bastille. He had retained his government of Poltou, and the direction of the artillery, the fortifications, and the roads and bridges; so, though retired from court, his life was neither private nor inactive. He was appointed a marshal of France by Louis XIII. in 1634. The favourite amusement of his declining years consisted in preparing his Memoirs 'of the great and royal economies of Henry IV.' for publication. The first two volumes of S.'s Memoirs were published in 1634, but without date; the third and fourth rolumes in 1622. volumes in 1662.

Sully-Prudhomme, René François Armand (1839-1907), a French poet, born and educated in Paris, and became a lawyer's assistant. His works, mostly of a philosophical nature, include: Stances et Poèmes, 1865; Les Epreuves, 1860; Les Solitudes, 1869; Les Destins, 1872; Les Vaines Tendresses, 1875; La Justice, 1878; Le Bonheur, 1888; L'Expression dans les Beaux Arts; Réflexions sur l'Art des Vers, 1892; a metrical trans-Part des Vers, 1892; a metrical translation of the De Rerum Natura of Lucretius; and Etude sur Pascal. He was elected to the Academy in 1881. His best work is marked by a severe beauty of form and a serene melancholy of thought, and often shows great intellectual power. Sulphonal, (CH₂)₂C(SO₂C₂H₆)₂, is prepared by condensing acetone with other mercantage in the presence of

ethyl mercaptan in the presence of hydrochloric acid, and oxidising the resulting mercaptole with perman-ganate. It forms colourless crystals (melting point 126°) slightly soluble in water, and is used largely as a hypnotic

Sulphur (S. 32), a non-metallic ditions, or when crystallised from a gypsum (CaSO₄), heavy spar (BaSO₄), and Epsom salts (MgSO₄), and also in the sulphides of zinc (blende), lead (galena), antimony (stibnite), and in pyrites. To free natural sulphur from pyrites. To free natural sulphur from earthy impurities it is stacked in brick kilns having a sloping floor and ignited with burning brushwood. Some sulphur burns and the heat of its combustion causes the remainder to melt and flow away from the impurities into rough moulds. About one-third of the total sulphur present is wasted by this method. Pyrites is sometimes burned in order to obtain sulphur, but more generally the pyrites is roasted with excess of air to obtain sulphur dioxide for the sulphuric acid manufacture. A great source of the supply of sulphur is the alkali-maker's waste (see Alkali). The sulphur is obtained from this The sliphur is obtained in the material by Chance's process, which consists in decomposing the moist waste with lime-kiln gases (carbon and change). Carbonate of lime and hydrogen sulphide are the ultimate products of the reaction, the latter of which is either burned with excess of air to sulphur dioxide and used in the sulphuricacid manufacture, or burned with a limited supply of air and the sulphur obtained in the free state. The crude sulphur thus obtained is purified by distillation from iron retorts into brickwork chambers. In these chambers the sulphur condenses and forms a powdery deposit, the 'flowers of sulphur' of commerce. As the distillation goes on the temperature rises, the powder melting to an amber-coloured liquid which is run out into wooden moulds, forming the well-known 'roll sulphur.' phur exists in four allotropic modifications, viz., octahedral, prismatic, plastic, and amorphous. Native sulphur is octahedral, and is a pale yellow solid, soluble in carbon disulphide and in benzene, turpentine, etc. It is an extremely bad conductor of electricity and heat. At 114.5° C sulphur melts to an amber-coloured pounds are burned in air. For the mobile liquid. When the tem is further raised, the liquid in colour and becomes more
until at 230° C. the liquid appears 880_z. The laboratory method of almost black and cannot be poured representation or leating copper

element which occurs in the free hot solution in oil of turpentine. It element which occurs in the free not solution in on of tarpentine. At state chiefly in volcanic districts, e.g. forms monoclinic crystals which melt Italy and Sicily, Iceland, Japan, and U.S.A. In combination with other stable, but slowly passes to the elements sulphur is widely distributed, occurring in the sulphates tures. Plastic sulphur is formed tributed, occurring in the sulphates when melted sulphur is poured into water. It is tough and elastic and insoluble in carbon disulphide, but is unstable and in a few days passes to the rhombic state. The amorphous variety of sulphur is insoluble in carbon tained b

soluti Flowers of sulphur' is mostly the octahedral or rhombic variety, although some amorphous sulphur is present. 'Milk of sulphur' used in medicine is produced by the action of hydrochloric acid on polysulphide of lime. Sulphur burns easily in air, forming sulphur dioxide. It combines directly with many metals and non-metals, forming sulphides, e.g., iron and copper burn brightly in sulphur vapour. Sulphur is used as an in-sulator in pyrotechnics and in medicine as an aperient. A few of the more important simple compounds of sulphur are the following: Hydrogen sulphide or sulphuretted hydrogen (H2S) is a gas which escapes from volcanoes, and is also found in some mineral waters which are reputed cures for rheumatism and some skin It is commonly prepared diseases. by the action of dilute hydrochloric by the action of dilute hydrochloric acid on ferrous sulphide in a Kipp generator (FeS+2HCl=H₂S+FeCl₂). Hydrogen sulphide is a colourless, poisonous gas, with a smell like rotten eggs. It is fairly soluble in water, its solution being slightly acid to litmus. It burns in air with a illage form for sulphy digital water. flame, forming sulphur dioxide, water, and free sulphur. Its value in the laboratory is as a reducing agent and on account of the fact that it precipitates the sulphides of certain metals from solution. The gas is absorbed by lime, with the formation of calcium hydrosulphide, and also by calcium sulphide (see Chance's process above). Sulphur dioxide, sulphurous anhy-

dride (SO₂), is a gas met with in the emanations from volcances, and is formed wherever sulphur or its com-

is prepared by roasting : 4FeS2+11O2=2Fe2O2+

amost black and cannot be poured in the vessel. Further rise of temperature causes the liquid to regain the rise of temperature causes the liquid to regain the rise of temperature causes the liquid to regain the rise of th

vols. of gas), forming an acid solution in which the reactions take place (see SULPHUROUS ACID). The gas is The sulphur dioxide is produced by easily liquefied (at -10° under ordin- burning sulphur or more generally by ary pressure) and is thus supplied in that condition in syphons. The liquid is used as a refrigerator, low temperatures being produced by its rapid evaporation. The solution of the gas in water is used as a reducing agent and for bleaching straw and wool. Sulphur dioxide is used as a disinfectant and as an 'antichlor' to remove last traces of chlorine from articles bleached with the latter.

Sulphur trioxide, sulphuric anhydride (SO₂), is produced when a mixture of oxygen and sulphur dioxide is passed over heated platinised as-bestos, or it may be conveniently prepared by gently distilling pyro-sulphuric acid. It is a white crystalline solid (melting point 15° C.) which fumes in contact with air and combines violently with water to form

sulphuric acid.

Sulphuric Acid, Hydrogen Sulphate, or Oil of Vitriol (H.SO₄), is formed when sulphur trioxide is dissolved in water. Commercially the acid is formed by two processes—the 'Chamber' and the 'Contact' pro-

cesses.

Chamber Chamber process.—This depends upon the formation of sulphur trioxide from the dioxide and the subsequent solution of the former in water. Sulphur dioxide does not become oxidised to the trioxide without the aid of a catalytic agent. When sulphur dioxide and oxygen are mixed with nitrogen peroxide in the presence of steam a series of reactions takes place resulting in the formation of sulphuric acid. The sulphur dioxide, nitrogen peroxide, and water give rise to the formation of nitrosulphonic acid and a molecule of nitric oxide: 2SO₂ + 3NO₂ + H₂O = 2H(NO)SO₄ + NO. This nitro-sulphonic acid forms white crystals which are decomposed in the presence of water to sulphuric acid and a mixture of nitric oxide and nitrogen peroxide: $2SO_2(HO)(NO_2) + H_2O = 2H_2SO_4 + NO + NO_2$. The nitric oxide oxide in the nitric oxide oxide. coming in contact with pheric oxygen is reconverted to the peroxide. These reactions form the basis of the chamber process of the sulphuric acid manufacture. In the process the nitro-sulphonic acid (chamber-crystals) is not actually isolated unless the supply of water is accidentally deficient. The sulphurio accidentally deficient. The sulphuric acid plant consists of four main parts, viz.: Apparatus for (1) producing sulphur dioxide; (2) for the production of oxides of nitrogen, and (3) for the oxides of nitrogen, and (3) for the absorption of oxides of nitrogen from the gases leaving the chambers, and, lastly, the chambers pyrites burners is passed into a 'dust-

roasting pyrites in kilns with a regu-The supply of equires to be lated supply of air. nitrogen peroxide requires replenished owing to loss, the gas being generated by the action of sulphuric acid on nitre contained in earthenware pots and placed in the flue of the pyrites burners. Three to four parts of nitre are required for pyrites. For the absorption of the nitrogen peroxide from the chamber gases, the Gay-Lussac tower is employed. This consists of gases, the Gay-Lussac tower is em-ployed. This consists of a square leaden tower filled with coke frag-ments and down which a stream of cold strong sulphuric acid percolates. Nitro-sulphonic acid is formed by the absorption of the peroxide, and this is then pumped to the top of the 'Glover' tower which is filled with flint fragments. Down this tower it is allowed to percolate, and the de-scending stream meets with the hot gases from the pyrites burners which pass upwards to the first chamber. Denitrification takes place, sulphuric acid being re-formed and nitric oxide liberated, and this is swept into the chambers with the other gases. A quantity of chamber acid is also allowed to flow down the Glover tower where, meeting the hot gases, it becomes partially concentrated. The chambers into which the gases are led are made of sheet lead joined up by autogenous soldering. The order of the process then is the following: or the process then is the following: The gases from the pyrites burners are led through the Glover tower, where they effect the denitrification of nitro-sulphonic acid, and then pass to the chambers, where they meet the necessary supply of steam. Sulphuric acid collects in the chambers and is withdraw when it received. withdrawn when it reaches a specific gravity of 1.6, otherwise the leaden chambers are corroded. Finally, after chambers are corroded. Finally, after passing through the chambers, the gases are passed up the Gay-Lussac tower, where the nitrogen peroxide is absorbed, and returned to the chambers through the intervention of the Glover tower as explained above. The acid if so required is further concentrated in leaden pans, or if a high degree of concentration is wanted, in glass or platinum vessels. Impurities, such as lead sulphate, arsenie, and oxides of nitrogen, are cenerally present in the acid. The generally present in the acid. The arsenic is removed by precipitation as the sulphide and other impurities are got rid of by distilling the acid after addition of ammonium sulphate. Contact process.—A mixture of sulphur dioxide and air from the

chamber ' into which jets of steam | aust and sufficiently cooled, the consists of a solution of sulphur cowers where they meet a descending Several hydrates with six, ten, and are dried by passing up towers down known. The solution sulphur fourteen molecules of water are known. The solution smells strongly which concentrated sulp percolates. The pure coefficients and conductive dioxide and conductive the concentrated sulp percolates. The pure coefficients are dioxide and conductive the concentration of the concentration of the content of the concentration of the content of th percolates. The pure gas admitted to the contac

heat is generated by the reaction, and care is taken to prevent the temperature from rising above 350° C. Sulphur trioxide is formed and is dissolved in water, forming sulphuric

which contains platinised

acid. Sulphuric acid is a colourless, oily liquid (sp. gr. 1.8) which has a great affinity for water. The strongest acid contains about 2 per cent. water, and on cooling to 0° C. this acid forms crystals which melt at colourless 10.5° C. On account of its powerful affinity for water, the acid is used as a desiccating agent. If the acid is poured on wood or sugar the elements of water are withdrawn and carbon The mixing of the acid with left. water is accompanied by a great evolution of heat, hence care must be taken when mixing, otherwise explosive ebullition takes place. Sulphuric acid is used in the Leblanc process for carbonate of soda, in galvanising, in timplate and in aerated water industries. The acid is dibasic, forming both normal and acid salts. Of the normal salts, several occur in nature, viz., barytes (BaSO₄) and Epsom salts (MgSO₄).

The sulphates are mostly soluble in water, those of lead, calcium, and strontium are only sparingly soluble, while barium sulphate is insoluble in water and in acids. This last salt is, therefore, used as a test for the presence of the acid. Addition of a soluble barium salt to a sulphate is followed immediately by the precipitation of the insoluble barium sul-The acid salts are similar in properties to the normal salts, but have an acid reaction. The alums are a well-known group of double are a well-known, sulphates (see ALUM).
Sulphates (see ALUM).
Nordhausen,

fuming sulphuric acid is obtained by dissolving sulphur trioxide in sulphuric acid, but is prepared by the distillation of ferrous sulphate in clay retorts. It is a colourless, strongly faming liquid (sp. gr. 188) and solidifies on cooling to a crystal-line mass (melting point 35° C.). It forms a stable series of salts known as the disulphates.

Sulphuric Ether, see ETHER.

Sulphurous Acid is known only in are injected. Being now freed from solution and in its hydrates, and

ir to sulphuric acid. It is forms two series of salts. sulphites prepared by if excess of hydroxide or ferric oxide on perforate and excess of hydroxide or The operation is started by gentle carbonate of the metal upon the heating, but once started, sufficient acid, e.g., sodium sulphite (Na,SO₂). (2) Acid sulphites such as potassium hydrogen sulphite (KHSO₃), which is prepared by having excess of acid acting on the hydroxide. The alka-line sulphites are soluble in water, the sulphites of other metals being in-soluble or nearly so. The meta-bisulphites (e.g., T. SO, SO,) and the bisulphites are also derivatives of the acid and are used in photography. Chemically the sulphites and the acid

are reducing agents. Sulpicia, the name of two Roman poetesses: 1. Niece of Messalla, lived in reign of Augustus and wrote elegiac poems addressed to Counthus. 2. Lived in reign of Domitianus and wrote a volume of poems dealing with her husband Calenus.

Sulpicians, an order of priests in the Roman Church founded in 1645 for training candidates for the priesthood. It receives its name from the

Church of St. Sulpice in Paris. Sulpicius, Publius Rufus (124-88 n.c.), a Roman orator and statesman. In 89 he was legate to Strabe in the Social War, and in 88 tribune of the plebs, and soon afterwards declared for the popular party and attempted to obtain the command in the Mithridatic War for Marius. His franchise bill to this end met with the opposition of the senate, and S. and Marius stirred up riots till the bill was passed. Immediately Sulla marched on Rome and S. was beheaded.

Sulpicius, Servius (surnamed monia), a contemporary and friend of Cicero. He became one of the best jurists as well as most eloquent orators of his age. He appears to have espoused Cæsar's side in the Civil War, and was appointed by Casar proconsul of Achaia (46 or 45). He died in 43 in the camp of M. Antony, having been sent by the senate on a mission to Antony, who was besieging Dec. Brutus in Mutina. S. wrote a great number of legal works.

Sulpicius, Severus (363-410), ristian ecclesiastical histori Christian historian. born in Aquitaine. He was a friend of St. Martin, Bishop of Tours, and wrote his life and Historia Sacra from the creation.

Sultan, a Mohammedan title of

Sultan of sultans of Fadishah.

Sultanpur: 1. The cap. of Sultanpur dist., United Provinces, India, 60 m. N.E. of Allahabad. Pop. 10,000. 2. A tn. of Gurgaon dist., Punjab, India, 30 m. S.E. of Amritear, with salt works. 3. A tn. of Darbhangah dist., Bengal, India, 35 m. N.E. of Patna. 4. A tn. of Karpurbhala state. Punjab India. Pop.

thala state, Punjab, India. Pop. 9000. 5. A tn. of Kangra dist., Punjab, 60 m. N.W. of Simla. Sulu (Sooloo, Yolo, or Jolo) Archipelago, a group of the Eastern Archipelago, a pelago, having the Sulu Sea on the N.W., the Sea of Celebes on the S.E. There are about 190 islands, divided into six groups. Total area about 1550 5q. m. They belong to the U.S.A.

Sulu Sea, or Sea of Mindoro, sea of Pacific Ocean, lying between lat. 5° N. and 12° N. and long. 117° E. and 123° E. N.E. are the Visaya Islands; S.W., Borneo; N.W., Paragua; and S.E., Mindanao and the Sulu Islands.

Sulzbach: 1. A tn. of Upper Palatinate, Bavaria, Germany, 30 m. S.E. of Bayreuth, in mining dist. Pop. 5480. 2. A com. of Rhenish Prussia, 5 m. N.E. of Saarbrücken. Pop. 22,433.

Sulzer, Johann Georg (1720-79), a Swiss philosopher, born at Winter-thur; educated at Zürich. In 1742 he went to Berlin, where he met Euler and Maupertuis, and became professor at the Joachimsthaler Gymnasium (1747) and the Ritter-akademie (1763). His works include Theorie Allgemeine der schönen Künste, and Nachträge, oder Charakteristik der vornehmsten Dichter aller Nationen.

Sumach, Sumac, and Shumack are names given to Rhus Coraria, species of Anacardiacem found in S. Europe. Its leaves when ground are used in dyeing and tanning. The West Indian S. is a species of Brunellia.

Sumarokov. Alexander Petrovitch (1718-77), a Russian dramatist, born in Finland and served in army. He was made director of the first permanent theatre at St. Petersburg in 1756, and staged his works there and at Moscow.

Sumatra, a large island of the Dutch Sumatra, a large island of the Duck.
E. Indies, lying W. of Borneo and
S.W. of the Malay Peninsula, trending from N.W. to S.E., its W. shores
being washed by the Indian Ocean. It is divided into six districts—West S., East S., Benkoelen, Lampongs. Palembang, and Atchin or Atjeh—its area subsequent amending Acts. See amounting to 161,612 sq. m., and its JUSTICES OF THE PEACE, and POLICE. popt. to 3,200,000, mainly Malays. Its summer, that portion of the year surface is mountainous, especially when the part of the earth in question

dignity borne by numerous Eastern near the W. coasts, where there are and African rulers; e.g., those of Turkey and Morocco. The former is an altitude of nearly 10,000 ft. The the 'Sultan of sultans' or 'Padishah.' Sultanpur: 1. The cap. of Sultanpur rivers, the Musl and Jambi (both pur dist. United Provinces, India, 10,000 ft.) The country is watered by numerous sultanpur dist. United Provinces, India, 10,000 ft. 500 m. respectively) being the chief. Numerous islands surround the coast, the largest being Banka Is. in the S.W. Parts of the island are densely forested, vegetation is luxuriant, and the climate is tropical. In the north of S., near Atchin, coal is mined and petroleum extracted. Gold, copper, iron, sulphur, and saltpetre are also found. Other products include pepper, nutmegs, spices, sago, millet, cocoa, coffee, betel-nuts, and rice, which are all extensively grown. Wild animals abound, the birds are in great variety, and insect pests swarm. The equator divides the island into two almost equal parts. S. was visited by the Portuguese in 1509, and by the Dutch and English a century later. In 1825 the English possessions were ceded to the Dutch in exchange for Malacca. See Breitenstein's Sumatra, 1902.

Sumbawa, one of the Lesser Sunda Islands, Malay Archipelago, separated on the W. from Lombok by the Strait of Allas and on the E. from Komodo by Sapi Strait. Area 4300 sq. m.; length 160 m.: breadth 20 to 60 m. On the N.E. is Tamboro (9000 ft.), a destructive volcano.

Dutch protection.
Sumbul, an E. Indian name applied to two plants which have fragrant roots. One of these, known also as musk-root, is Ferula sumbul, and is a species of Umbelliferæ; the other is Nardostachys Jalamansi, the spikenard, a species of Valerianaceæ.

Sumir, a prov. of Babylonia (q.v.).
Sumir, a prov. of Babylonia (q.v.).
Sumiswald, a com. of Switzerland,
in the canton of Berne, 15 m. E.N.E.
therefrom. There are manufs. of
linen and cheese. Pop. 5563.
Summary Jurisdiction. The S. J. of
justices of the peace is a power con-

ferred on justices by various Acts of Parliament to try certain minor offences without the aid of a jury and to make orders for payment of money on complaint. Generally speaking, S. J. is confined to matters occurring within the county borough or other district for which the justice has been appointed in the commission of the peace, or within 500 yards of the boundary of such district, or upon a vehicle or vessel whilst on a journey The prothrough the jurisdiction. cedure is regulated by the Summary Jurisdiction Acts, 1848 and 1879, and

is nearest to the sun and thus has its slavery. In 1851 he was elected to highest temperature. In the northern the senate, and continued his oppo-hemisphere S. lasts from the entry of sition; in 1856 he was assaulted by the sun into the zodiacal sign of Cancer, about June 22. till the the autumnal equinox of Sept. 21. The S. of the southern hemisphere corresponds to the northern winter.

Summer Isles, a group of islands at the N. entrance of Loch Broom, Scotland. The largest is Tanera More, which also is the only one inhabi-

Summerside, a scaport of P Edward Is., Canada, the cal. Prince co., on Bedeque Bay Prince Edward Island R., 40 m. 1. .. of Charlottetown, with an excellent harbour, and flour and saw-mills. Pop. 3000.

Summit, a city of Union co., New Jersey, U.S.A., on Lackawanna R., 11 m. S.W. of Newark. It forms a kind of residential suburb of New York and is a summer resort. Pop.

(1910) 7500.

Summons, in law, a citation to appear in court. It is a written notification, sigued by the proper officer, to be served on a person warning him to appear on a specified day answer the claim of the plaintiff. the High Court procedure a writ of S. is the initial document of a common law action. It contains inter alia an indorsement of the nature of the claim made, or of the relief or remedy required in the action, so that the defendant may know why he is sued. In some cases the plaintiff is allowed to state the particulars of his case in full detail, but the use of such specially indorsed writs of S., which take the place of a statement of claim, is only permitted in some half-dozen specified cases of liquidated demands (Order XIV. of the Rules of the Supreme Court). An originating S. is a document by which any person claiming to be interested under a deed. will, or other written instrument, may apply to the court for the determination of any question of construction or interpretation arising under the instrument and for a declaration of his rights. It is the customary numerous commencing mode οf actions in the Chancery Division. The issue of a default S. in the county court is the ordinary mode of commencing an action for the recovery of a debt in that court. A judgment S. is issued to enforce a judgment debt under pain of committal.

(1811-74), Sumner, Charles was born at American statesman, Boston, and educated there and at Harvard, being called to the bar in 1834. After travelling on the Con-tinent from 1837-40 he took an active 0 225 times that of the earth, or part in polities on his return, being 1.41 sp. gr. The S.'s surface gravita-noted as a determined opponent of tional attraction is 27.6 times greater

Preston Brooks and incapacitated for three years. His works, in fifteen volumes, were published 1870 - 83. See Memoirs (1877) by Pierce.

Sumner, Charles Richard (1790-1874), an English churchman, was private chaplain to George IV. at Windsor. Later he became Bishop of Win-

work was Thrist practi-See Life 876.

Sumner, John Bird (1780-1862). Archbishop of Canterbury, was educated at Cambridge. In 1818 he became rector of Mapledurham, in 1828 Bishop of Chester, and twenty years later was appointed to the see of two works are:

A Treatiseion and on ie Creator. hristianity! Reception,

1824.

Sumptuary Laws (Lat. sumptuarius, from sumptus, expense). S. L. or regulations were such as restrained or limited the expenses of citizens in wearing apparel, equipages, the pleasures of the table, furniture, etc. Such laws were in former times frequently enacted both in England and in Scotland, but have been in desuctude for centuries. Those of England were repealed in 1601 by one of the first Acts of the reign of James I.

Sumter, a city of S. Carolina, U.S. A and cap. of Sumter co., \$1 m. N.W. of Charleston. It is a trade centre for an agricultural region, and exportcotton and tobacco. It was founded in 1800, and named after General Sumter. Pop. (1910) 8109.

Sumter, Fort, see FORT SUMITER. Sumy, a tn. of S. Russia, in the gov. of Kharkov, 83 m. N.W. of the city of Kharkov. It is a trade centre for the Ukraine, and has manufs, of sugar. Pop. 28,000.

Sun, The, the parent body of the solar system, the star to which the visible planets belong, has a mean parallax of about 8.796", corresponding to a mean distance of 92.93 million miles; its angular diameter is 1920 ±0.03", corresponding to 865,000 m.; its mass 332,800 times that of the earth. Taking the weight the earth at 1.317 × 1025 lbs. (Burgess), that of the S. is 4.38×1000 The volume of the S. being

Its equator is inclined to the cellptic at an angle of 7° 15′, to the plane of the earth's equator at 26° 16′; its axis points midway between Vega and the Pole Star, R.A. 18 hrs. 44 mins., dccl. 64°. Rotation.—The density of the S. Indicates a gaseous state, and rotation is therefore of a different class from that of the earth. Carrington and Spörer from observations of sunspots gave about twenty-five days as the period for equatorial rotation. the period for equatorial rotation. The former expressed his result by the equation X=865'-165' sin 7th, where X=dally rate, l=latitude. Similar results have been obtained by Stratonoff and Chevaller from measurements of faculæ. Fox and Hale have made determinations from repetrolellographs of hydrogen and spectroleliographs of hydrogen and calcium flocculi, but the line II& gave no retardation for higher latitudes. Duner, Halm, and Adams have made researches on various spectral lines, williature the Depulse of the control of the con utilising the Doppler effect, since one side of the S.'s disc will show approach, the other recession. The result (Adams) is 24.6 days at the equator, 26:3 days at 30° lat., 312 days at 60° lat., 35:3 days at 80° lat.; his equation being $\zeta=10.62^{\circ}+3.99^{\circ}\cos^{2}\phi$. \(\frac{\pi_{\text{angular}}}{\pi_{\text{angular}}} \) side \(\frac{\pi_{\text{angular}}}{\p sphere (q.v.), the reversing layer, the chromosphere (q.v.), and the corona; beyond these is the general question of radiation. Reversing layer.—Kirchhoff's theory regarding the dark lines in the solar spectrum supposed a layer of gaseous matter, through which light from the photosphere must pass to reach the earth. At the temperature of the S., this would be incandescent, and would give a bright line spectrum if separately observed. This was accomplished in the total eclipse of 1870 by Professor Young. At the moment of totality, the light of the photosphere being obscured, the bright lines forming the spectrum of the reversing layer were visible as a flash spectrum. Metallic lines are numerous, and the layer, which is continuous with the chromosphere, has a thickness estimated variously at 500 to 100 0m. Corona. -So far only visible during the few seconds of totality during an eclipse, this extends irregularly for a distance of one or possibly two diameters of the S. beyond the moon's disc. Its spectrum is more nearly continuous than that of the photosphere, with a

than terrestrial surface gravitation, scopically. There appear to be rayof incandescence, reflection, parti-cularly from its outer part, and luminescence; its likeness to the aurora has led to theories of electrical constitution. Comets pass through the substance with no measurable resistance. It appears as a series of radial streamers, 'pearly hued,' emanating from the S., and varies with the sun-spots, a period of cleven years having been estimated. At sun-spot minimum, the equatorial streamers are long, at maximum the rays are of shorter length and more evenly distributed round the S. Radiation.— The quantity of sunlight has been estimated at 1575×10²¹ candle-power; its intensity is given as 150 times that of the lime-light. Yet were the S. deprived of its absorbing envelope of gases, it would shine with 2.5 times its present power, and would appear blue, those rays being most absorbed. The light of the S. distinctly fades towards the limb, the outer portions passing through a greater thickness of absorbing envelope. The temof absorbing envelope. The temperature of the photosphere has been estimated to exceed 5860° C. abs., or even 6260° C. abs., while it may reach 7000° C. abs. Young states that the heat received from the S. would be sufficient to melt a layer of ice 226 ft. thick on the earth's equator annually; the energy on each square foot of the earth's surface, if utilised in a porfeet heat engine, would be sufficient annually to raise a hundred tons to the annually to raise a numered tense the height of a mile; at the S.'s surface a thickness of 64 ft. of ice would be melted in one minute. Of the total heat energy of the S., the earth receives 1/22 × 108. No diminution in the energy of the S. has been detected, and the evidence of plant distribution points to no directors. tribution points to no diminution. Fluctuations in the radiation of the S. have occupied attention with very varying results, but evidences have been obtained at the Smithsonian Observatory on Mt. Wilson. Fig. 1. Illustrates the result; the values being reduced to mean solar distance. An amplitude of change of 3.5 per cent. is frequent, while 10 per cont. is sometimes reached. The figures in the vertical column give the 'solar constant '(but for slightly more correct figures see Annals, Smithsonian Astronomical Observatory, vol. iii., Figs. 9-14, 1913). The 'solar constant 'expresses the total intensity of solar radiation outside the earth's atmosphere at mean solar distance; simultaneous observations in 1900 and 1910 on Mt. Wilson (1 m. high) and Mt. Whitney (3 m. high) gave few bright lines, notably the green and Mt. Whitney (3 m. high) gave 5303 of 'coronium' not yet discovered on the earth. Its rotation with the S. has been confined spectrodistribution of energy throughout the doubtful. The halogen group: fluorine, solar spectrum is shown in Fig. 2, chlorine, bromine, iodine; the oxygen which gives two successive bolometric observations on Mt. Wilson through tellurium; the nitrogen group: nitroa 60° flint glass prism.

At places gen, phosphorus, arsenic, antimony;

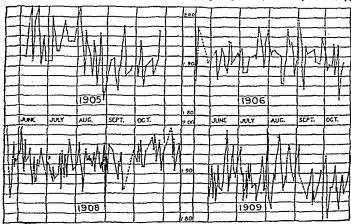
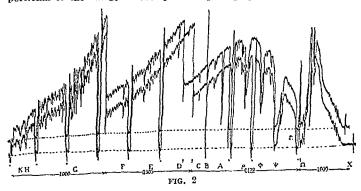


FIG. 1

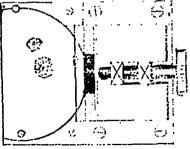
marked; the S.'s rays were cut off to give a zero radiation base line; at places marked; screens were interposed to reduce intensity to keep the curve on the photographic plate. The heights above the base line are proportional to the energy of the spec-



trial elements; twelve others are conditions at different depths within

trum rays. Fraunhofer liues, some of mentioned are supposed to be in that which are indicated by their letters, order of distance from the S. 's centre. Show as depressions of the curve. The spectrum of the S. has shown the lines of each element gives some idea existence there of thirty-six terres- of the pressure and temperature conditions at different deaths within

rangement of the slit for the observa- sediment was deposited. tion of spectra of prominances. See C. G. Abbott, S.M., The Sun, 1912; Lockyer, Chemistry of the Sun. 1887,



PIG. 3.—METHOD OF OBSERVING THE SUN'S LIMB SPECTROSCOPICALLY

and The Sun's Place in Nature, 1897; Ball, Story of the Sun, 1893; C. A. Young, The Sun. See also SOLAR SYSTEM: CHROMOSPHERE: PHOTO-SYSTEM; CHROMOSPHERE; PHOTO-SPHERE; SPECTRUM, and RADIATION.

Sun Animalcules, see HELIOZOA. Sunart, Loch, an inlet opening into the Sound of Mull, Argylishire, Scotland. It is about 20 m. long, with a varying width of ½ to 3 m.

Sun-bear, the Ursus (or Helarctos)
malayanus, a small black bear found

in Malay.

Sun-birds, the various species of passeriform birds in the family Necta-rinidæ. They are inhabitants of tropical parts of the Old World, frequenting Africa, India, Papua, and N. Australia. In appearance they are extremely brilliant, shining with metallic colours, and they are of very small size.

Sun-bittern, or Eurypyga helias, a gruiform bird of the family Eurypygide, which occurs in the northern part of S. America. It is fairly large, and has a long neck, slender bill, and pervious nostrils; the plumage is mottled, but the chief shades are brown, black, and white. It frequents the months have been said to be shades and white the months have been said to be said to be shades.

the marshy banks of large rivers.
Sunbury: 1. A tn. of Pennsylvania,
U.S.A., and cap. of Northumberland co., on the Susquehanna R., with an export trade in lumber, and railway works. Pop. (1910) 13,770. 2. A tn. of Victoria, Australia, in Bourke co., 28 m. N.W. of Melbourne. Pop. 2500. 3. A market tn. of Middlesex, England, on the Thames, 17 m. S.W. of London. Pop. (1911) 4607.

Sun-cracks, or Desiccation-cracks, are produced in mud which is exposed to sun and rain. Their existence in

strata proves that the surface of the rock on which they lie was exposed means one who carries on the business

the S.'s surface. Fig. 3 shows the are and dried before the next layer of

Sunda Islands, in the Malay Archipelago, are situated in the Indian Ocean. They comprise Java, Sumatra. Borneo, Celebes, Banka, etc., among the Great Sunda group, and in the Lesser Sundas are Ball, Lombok, Sumbawa, and Timor, etc.

Sunda Sea, the western extension of the Banda Sea, E. Archipelago, be-tween Flores and Celebes and 120°

and 125° E.

Sunday, see Sabbath. Sunday Island, see RAOUL.

Sunday Schools, in their modern form, owe their origin to Robert Raikes, a printer living in the town of Gloucester, who scheme in 1780. who inaugurated scheme in 1730. Long before this, however, some kind of Sunday religious instruction had been in use, having been taken over by the early Christians from the Jewish Church. During the middle ages, however, catechising and preaching had fallen largely into disuse, and the mass of the people were very ignorant. Among those who attempted reform by means of Sunday instruction we may mention Luther, Knox, and St. Charles Borromeo. The scheme of Raikes, however, was a larger and more permanent one, and in its initiation he was greatly helped by the Rev. Thomas Stock, to whose suggestions the scheme was indeed due. He proposed to make the S. S. a normal part of the equipment of every church, and the scheme spread rapidly throughout Great Britain, aided as it was by the publicity which Raikes gave it first in the Gloucester Journal. later (1785) in the Scholar's Companion. Paid teachers were at first employed, and reading and writing were taught along with the Bible. But by the end of the 18th century voluntary teachers found in sufficient numbers to make payment unnecessary. S. S. were introduced into America in 1791, and here they have taken firmer root than anywhere else. In 1817 the Sunday and Adult School Union was formed, and this developed in 1824 into the American Sunday School Union.

Sunday Trading and Sunday Closing. The basis of the law as to Sunday trading is the old Sunday Observ-ance Act, 1677, which provides that no tradesman, artificer, workman, labourer, or other person whatsoever (sc. ejusdem generis) fourteen years of age or upwards may do or exercise any worldly labour, business, or work of his ordinary calling upon the Lord's Day, works of necessity or charity alone being excepted. 'Tradesman' in the above context

XII

of buying and selling, so that barbers [In 1671-72 he was employed by are not bound to close on Sundays Charles II. on embassies to Madrid (Palmer v. Snow, 1900), and apparand Paris. He renounced Protestantently farmers are outside the Act (R. v. Silvester). By the Bread Act, 1836, making bread or cakes on Sunday or, after 1.30 P.M., selling the same, is punishable by fine. Places of entertainment or amuse-part are affected by the Sun ment are affected by the Sun-day Observance Act of 1780, which Act renders the 'chairman of the entertainment,' 'manager,' 'conductor, 'keeper of the house,' or 'master of the ceremonies' liable to penalties for opening or using a place for entertainment on Sunday where the public are admitted by payment of money, but the effect of this Act is largely nullified by the decision is quarium Com-

that the simple

public free and charging only for reserved seats took

the case outside the Act.
Sunder, Lucas, see Cranach, Lucas. Sunderbans, or Sunderbunds, the name given to the jungle region of swamps and islands in the southern part of the deltas of the Ganges and Brahmaputra. The name is derived distributed. from the Sundr which furnish

nortion of th grown.

Sunderland, a seaport and co. bor. of Durham, England, at mouth of R. Wear, 14 m. N.E. of Durham. Included in the municipal borough Monkwearmouth and Bishopwearmouth. The town is well built, and for the most part modern. Peter's Church has portions dating from the 7th century. S. owes its from the 7th century. S. owes its present importance to the rich coal mines in the vicinity. The Pemberton mine (2286 ft. deep) is the deepest in the world. There is an excellent harbour (area 150 acres), and wet docks and tidal basins. There are large shipbuilding yards and fisheries, iron marks and results of rless carthen. 151,159

Sunderland, Charles Spencer, Earl of (1674-1722), a statesman bibliophile. Entered Parliament for Tiverton as a Whig, 1695; succeeded to the title, 1702. In 1700 he gained the support of Marlborough by marrying his daughter. He served on political missions to Vienna and Berlin, 1705; became Secretary of State, 1706, but was dismissed in 1710; became Lord Privy Seal, 1715, after serving as lord-lieutenant of Ireland, and during 1718-21 was First Lord of the Treasury.

Sunderland, Robert Spencer, second is sheltered t Earl of (1640-1702), born at Paris, sawmills, st...

ism in 1687, but was obliged to flee to Rotterdam in 1688, became again a Protestant and entered the service of William of Orange, who as William III. made him Lord Chamberlain in 1697.

Sundew, or Droscra rolundifolia, a species of Droscracem found in bogs and noted as an insectivorous plant (q.v.).

Sundials are instruments for giving the time of the day by means of a shadow cast by the sun. There is the dial on which the hours are marked which receives the shadow, and a style or gnomon from which the shadow is cast. The simplest form is obtained by a gnomon fixed, parallel to the earth's axis, on a dial parallel to the equator; mid-day is marked where the meridian of the place emerges from the dial, and the hours are equally distributed round its circumference. Most S., however, have horizontal or vertical dials fixed on pedestals or the walls of buildings, and on these the hours are unequally distributed. To place the divisions on a horizontal dial for a particular latitude, a globe with the twenty-four meridional spaces may be taken, and a strip of paper passed round the great circle passing through the point of latitude: the points of intersection of the meridians on the paper may be marked and transferred to the dial. The gnomon must be fixed, a tri-angular plate is bent with one edge acting as gnomon, at an angle to the dial equal to the latitude, and lying in the plane of the meridian. Or the divisions may be calculated from the formula $\tan H = \tan h \times \sin l$, where H is the hour-line, the angle between the hour-line and the meridian; h, the hour angle, the angle described by the sun between the given time and noon; I, the latitude. Time.—The works, and manufs, of glass, earthen-dial gives true solar time and corware, machinery, ropes and chains, rection is necessary; see DAY and anchors, chemicals, etc. Pop. (1911) EQUATION OF TIME. The forms of S. 151 159

> Lectures (Brewster's ed.). Sundsvall, a scaport of Sweden in the prov. of m. S.W. of

and a trade is carried on in timber and fish. Since 1888, when it was almost entirely destroyed by fire, it has been rebuilt, and is now a handsome city.

Pop. 16,855. Sun-fish, the term applied to all members of the perch-like family Centrarchidæ, as well as to several species in other families. Those of the Centrarchide are small, oval in shape, bright of colour, and inhabit the fresh water of N. America. Most of them build nests; in diet they are carnivorous, and they themselves serve as food for man. Other S. are Orthagoriscus (or Mola) mola and Ranzania truncata, both large species of Molide in the sub-order Plectognathi; Sclacke maximus, a mackerel-shark of great size; and Lampris luna, the opah, a species of Lampridide.

Sunflower, or Helianthus annuus, a ecies of Composite found in species America and cultivated in Britain for its large heads of golden florets. the United States the seeds, which are oily, are used as poultry-food and

as medicine for horses.

as medicine for noises.

Sungari, Songari, or Sunghwakiang, a large river of Manchuria, rising near the Korean frontier, in the Shan-alin Mts., and flowing N.W. to join the R. Naun and then N.E. to join the R. Amur, in about 47° 38′ N., 135 m. S.W. of the influx of the Ussuri. Its total length is about and it is norigable up to 850 m., and it is navigable up to The Kirin and sometimes further. river is deep (12-20 ft.) in most places, but occasionally spreads out to a width of a mile, when the depth is only 3-4 ft.

Sungei Viong was formerly a state, but is now (since 1895) part of Negri Sembilan, a British protectorate at the western extremity of the Malay Peninsula. The Malays are agricultural, the tin mines being worked by the Chinese. Area 1860 sq. m. Pop.

30,000, mostly Chinese.

(Σουνιον), Sunium the ancient Greek name for the headland, now called Cape Colonna, at the extreme S. of Attica. The ruins of a temple to Poscidon, which crown it, are still a landmark to sailors.

Sunn, or Sunn-hemp, a fibre obtained from the stems of Crotalaria funcea, a leguminous plant of the

E. Indies.

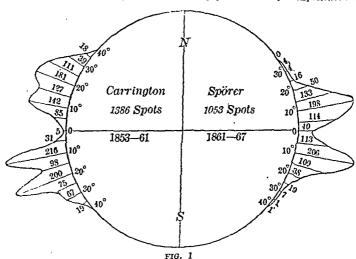
Sunnites, the orthodox section of the Mohammedans. The division among Moslems came on the death of Mohammed, since the Prophet had appointed no successor. The S. take their name from the Sunna, a collec-

breweries, are the chief industries, mentary to the Koran. The contents of the Sunna are, however, much inferior in value.

Sunshine Recorders are instruments for recording the time during which the sun is not obscured by cloud, fog, etc. That recommended by the meteorological authorities of Britain is the Campbell-Stokes, devised by Campbell in 1857 and improved by Prof. Stokes (1879). The simplest pattern for use in a particular latitude has a glass globe which acts as a lens, the sun's image being received on a card in the zodiacal frame. The card is hours accurately marked in fractions, and the concentrated rays burn a trace as the sun travels across the sky, the breaks showing the periods of obscured sun. Three grooves are provided to receive the cards, one each for winter, summer, and the equinoxes. The Jordan S. R., with the aperture in a closed cylinder, admits the sun's rays to a strip of photographic paper, graduated for time; the trace is fixed by simple rinsing in water, and this must be done, according to the recommenda-tions of the Royal Meteorological Society, before tabulating results. The photographic record gives some measure of the intensity of the sun's rays. In another form of the Jordan S. R. two hemispheres are arranged. one each for morning and afternoon sun. By adjustment in a quadrant on which latitude is shown, these instruments are adjustable for any latitude. For more accurate determinations of the sun's radiation platinum resistance thermometers, or thermo-electric couples, are used and are easily rendered self-registering. The Denis The Denis S. R. is a self-registering instrument depending on the different absorp-tive powers of a glass and black surface. A pivoted bent tube containing mercury has one end blackened and contains also some ether. blackened surface being more absorptive of heat rays, causes the ether to expand and displace the mercury which causes the tube to tilt over and complete the circuit of an electric current from a battery communicating with the registering apparatus. On the sun becoming obscured, the ether cools down and the mercury resumes its original position, causing the tube to tilt back, thus breaking contact. S. Rs. do not give a record cloudiness. which is usually visually estimated, though at night some indication is given by the Pole See Curtis Star Recorder (q.v.). tion of rules, regulations, legends, and sayir to contain to the first to contain the first to contain the sayir as supple to the sayir as supple to the sayir as supple to the say the say to the say the say

Sun-spots were discovered, some numerous at S. maxima, the corona, two years after the invention of the telescope in 1608, by Galileo, Fabricius, and Scheiner independently, appear to be distinctly connected appear to be distinctly connected. They vary greatly in size, some large ones being the diameter of the sun, or five times that of the earth; occasionally groups are found. Schwabe sionally groups are found. Schwabe (1843), from observations extending over twenty years, discovered a periodicity; Wolf and Wolfer after him have completed a record up to outsi the present time and extending back as fully as possible to 1610. Newcomb from these finds 4.62 years as max the period of increase in numbers, out i 6.51 as that of decrease, the full has lapsed a new disturbance rises. period being 11 13 years; in each case | Very great difficulty is experienced in

with large S., while climatic changes on the earth, such as exceptional rainfall and drought, have been con-



on the average. The full period observing or photographing details of ranges between extremes of 7.3 and spots on account of the heating of the 17.1 years. Lookyer, Halm, and wolfer have discovered that the more intense the outbreak of spots portrance. Secchi notes the appearing any period the shorter the time required for maximum development before the development of a spot. Lockyer considers the spot antecedes Further, the period from maximum to minimum is alwa. the increasing perio these periods there is Shuster in a evele. analysis finds periods of 11 125, years. All three a fractions of 334, and

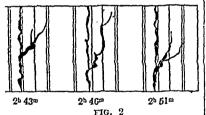
itely circular and re-

development;

seems to tumble ie chasm' (Secchi),

reciprocals of the firs reciprocal of the third. The periodicity of S. is shared by the facule, lasts on the average for two or three the prominences, which are most months, the record being eighteen

Spots have a small proper months. motion of their own apart from the sun's rotation, and any change of structure appears to be accompanied by a westward rush. Spectrum. This is generally weaker than that of the photosphere, particularly in the violet, a result at least partly due to diminished temperature. Adams. a strengthening of the line of sodium, a strengthening of the line of sodiam, calcium, vanadium, and chromium (partly), and a distinct weakening of all the hydrogen and silicon lines; but in the total Fraunhofer lines a strengthening; this points to a coolness of the reversing layer just above the spots. A further evidence of such cooling is the presence of the flutings due to titanium oxide and the hydrides of calcium and magnesium. The work of Hale from 1908, from a study of the Zeeman effect in the lines, showed that S. are not of the same polarity, double spots often being of opposite polarity, which is considered to in-dicate the presence of vortices or whirling motions within the spots.



There is no decided proof of the ascent or descent of gases within a spot, but Evershed has observed the The general conclusion appears to be that S. are evelonic disturbance gases radiating outward at the upper end; into the region of diminished pressure the upper-level hydrogen is sucked and its temperature increased. The vortices are in opposite directions in the N. and S. hemisphere, as are those of the terrestrial atmospheres. Fig. 2 shows at three times the hydrogen line in a S. trum, indicating a motion of 300 m. per sec. towards the observer. The

tigures reproduced are by courtesy of Messrs. Ginn & Co., from Young's General Astronomy. Sunstroke, Heatstroke, or Insolation, a condition of prostration or fever, brought about by excessive exposure

by disturbances in the respiratory and circulatory processes. The extent and form of these disturbances determine the various types of the disease. Thus, syncope may be the predominant symptom; the patient is sick and giddy, and ultimately falls into a fainting condition with a very weak pulse. He should be placed in a recumbent position, and efforts should be made to restore the circulation by stimulants, such as ammonia, ether, etc. Asphyxia may be the prevailing symptom, as in the form of S. known as heat apoplexy. This condition is marked by dark flushing of the face, protruding eyes, and ster-torous breathing. The best treatment is the application of cold by rubbing the skin with ice. Besides these two well-defined types of S., there are numerous varieties in which different forms of respiratory or circulatory disability are manifested. The treatment should in every case be symptomatic.

Sun Worship has been common at all times and in all parts of the world, for the sun is naturally regarded as the source whence comes light, heat, life, health, and other things needed by man. The sun-god was worshipped in Persia as Mithra, in Egypt as Ra, in Greece as Apollo, and under other names in Peru, N. America, and

Northern Europe.

Sun Yat-Sen (b. 1867), a mission convert's son. In 1892 he graduated with a degree in medicine at Hong Kong. An exile from China during the years 1895-1911, in consequence of the failure of a revolutionary conspiracy, he founded a political society in Japan, called the Tung Meng Hui, and was soon recognised as the leader and was soon recognised as the leader of the Young China party. In 1912, elected by the Nanking Assembly president of the southern provinces, he resigned his office after fourteen days in favour of Yuan Shih-kai. After supporting the latter for a while Dr. S. withdrew his approval, and was implicated in the unsuccessful revolution of 1913. See China.

revolution of 1913. See CHINA.

Supererogation, Works of, a class of works which, in the Roman Catholic system, are described as not absolutely required of each individual as conditions to his eternal salvation. Roman Catholics found this definition on the distinction between what they believe to be commanded and what they hold to be only counselled, for an example of which they appeal to the words of our Lord to the young man in Matt. xix. 21, which distin-guish one class of works which are necessary in order to 'enter into life,' to the sun's rays or to a high temperature. The disturbance of the guish one class of works which are normal processes by which the heat of the body is regulated produces; and a further class which must only effects upon the central nervous system of the processory in order to enter into life, and a further class which must only effects upon the central nervous system of the processory in order to enter into life, and a further class which must only effects upon the central nervous system. tem which are in their turn followed works of supererogation, as for all

supernaturally good works, they hold be gradually cooled to below the point that the assistance of God's grace is! indispensably necessary; and they do not ascribe to them any merit, except that which arises from God's own free and gratuitous promise. In a word, the only distinctive characteristic of a work of supererogation lies in its not being supposed to be prescribed or commanded as absolutely necessary for the salvation of the individual, but its being done for the sake of greater perfection. further consequence of this doctrine is that God may accept the superabundant works of one in atonement

for the defective service of another.
Superior: 1. The largest, most elevated, and most westerly of the five great lakes of N. America, and the largest body of fresh water on the globe. Area 31,000 to 32,000 sq. m., about one-third of which is in Ontario, Canada, and the rest in Mindental Mishigan U.S.A. Length 420 m., greatest width 160 m., mean depth 900 ft. It is fed by numerous streams, the chief the St. Louis, and discharges by St. Mary's R. at the F and into the st. Louis and discharges by St. Mary's R. at the E. end into Lake Huron. There are numerous islands. The water is very pure and abounds in fish. 2. Cap. city of Douglas co., Wisconsin, U.S.A., at W. end of Lake Superior, 6 m. S. of Duluth, with a good harbour and numerous manufactures and industries. Pop. (1910) 40,384.

Superior and Superiority, in Scots law, the person who makes a grant of land or a feu to a grantee is called the superior or few superior, and the grantee is or was called the vassal. the grantor be himself a vassal his grantee is sub-vassal and he himself mid-superior, while the mid-superior's superior is over-superior in relation to the sub-vassal. The interest retained by the superior in the fen is styled superiority or dominium directum, which interest was originally the ownership of the land subject to the more or less precarious right of the vassal; the interest acquired by the vassal was the dominium utile, i.e. the beneficial ownership.

Superphosphate of Lime, a mixture of calcium sulphate and monocalcium phosphate, and is obtained by treating bone ash or ground mineral phosphate with dilute sulphuric acid. It is used as an artificial manure, its value depending on the available

condition more solid or gaseous material than it will nor-mally hold in solution. Consider the case of a solid which can be dissolved to a greater extent as the temperature or an of the solution rises. If the solution viving

of saturation, the excess of solid is not at once deposited unless there is a present, such as another While the excess of solid is nucleus crystal. held in solution, the solution is said to be supersaturated.

Superstitious Uses, see CHARITIES. Suppe, Franz von (1820-95), an operettist, born in Dalmatia, studied under Cigala, Ferrari, and Seyfried; settled in Vienna, where he conducted at the Leopoldstadt Theatre (1862-95), for which he wrote nearly thirty operettas. His best-known work is the Poet and Peasant overture.

Supple Jack, a term applied to many climbing plants which have very pliable stems. Several of these belong to the order Rhamnacere, c.g. Œnoplia scandens and Berchemia volubilis.

Supply: 1. A grant of money provided in order to meet the expenses

Charles I. It nition at the (1688), when

Ss. were granted annually and the necessity for annual Ss. did away with the necessity for legally enacting that Parliament should meet every year. The power of voting Ss. is invested in the Commons, but the

but not his prinacking,

that is, making an ordinary measure into a financial one by tacking a financial clause to it. A money bill, or bill of S. must, however, receive the consent of Lords and king. 2. A term used to denote the system by which the army receives its Ss. of food. ammunition, and clothing. supplied chiefly by contract, but in some stations, e.g. Gibraltar, the bread and meat Ss. are obtained by the Army Service Corps, as they would be on active service. See Lini: OF COMMUNICATION, and ARMY-In

the field. Supply, Commissioners of, the Scotch C. of S., first appointed by the Act of Convention, 1667, were for over a century, before county councils were instituted in 1889, the leading local authority. Their special or primary function was to levy the land tax. In 1857 by the County Police Act they were given the duty through a police committee of providing a county police force. qualific has sinc

or an €

tax commissioners and to act with colouration of the skin. the county councils in the appoint extract from the glands of the sheep is ment of a standing joint committee used in the treatment of Addison's to manage the county police force and control capital expenditure and hemorrhage. horrowing. See Erskine's Principles

of the Law of Scotland.
Supply and Demand, the economic commonplace that the price of a commodity depends on S. and D. means that the price of commodities must be so adjusted whether consciously or unconsciously as to equalise the demand with the supply; and that, as a general rule, the demand increases with a decrease in price, and conversely, the demand decreases with an increase in price. Where the supply is absolutely limited (e.g. rare or first delitions) the supply is absolutely limited (e.g. rare or first delitions). editions of books) the supply is made equal to the demand by increasing the price to such a point that the demand in excess is withdrawn. Where the cost of production rises with every additional supply (e.g. coal, wheat) by reason of the greater proportional outlay of labour and capital, the supply must be increased to meet every increase in demand. Where the supply can be increased without the supply can be increased. without a corresponding increase in the cost of production (e.g. manufactured goods) prices rise temporarily when the demand exceeds the supply, but fall with the stimulated increase in supply. See Fawcett's Political Economy; Sidgwick's Principles of Political Economy.

Supporters, in heraldry, the figures placed on either side of a coat-ofarms, e.g. the lion and the unicorn on

the royal arms.

Suppository, a solid medicated body of a conical shape, weighing about 15 grains, designed for introduction into the rectum, vagina, or urethra. The majority of Ss. have a basis of theobroma (cocoa-butter). Gelatin is also used as a basis.

Suppuration, the process by which pus or 'matter' is formed. The usual cause of S. is the presence of pyogenic (i.e. pus-producing) micro-organisms.

Suprarenal Glands, or Capsules, triangular organs situated above the kidneys. Each consists of a cortical portion and a medulla. The cortex is made up of three layers of polygonal cells called respectively zona glome-rulosa, zona fasciculata, and zona relicularis. From the cortex fibrous septa extend towards the interior of the organ and divide the cells into groups. The medula consists of polygonal cells and nerve fibres. is believed that the function of the suprarenal capsules is concerned with pigment production, and a conspicuous symptom of Addison's disease, which is associated with disease of the suprarenal glands, is a bronze dis-

Suprarenal used in the treatment of Addison's disease, but still more for checking

Supremacy, Royal, is a term used designate supreme ecclesiastical authority. It is either papal or royal; but the former has for the most part, even in Roman Catholic countries, long ago been superseded by the latter. The papal supremacy was abolished by the legislatures of England, Scotland, and Ireland in the 16th century; but in order to ensure acquiescence in that abolition, particularly on the part of persons holding public offices in England and Ireland, an oath was, by an Act of 1689, required to be taken, called generally the oath of supremacy. This oath in its form, however, merely denied the papal supremacy; it contains no positive statement of the R. S. By an Act passed in 1791 it was provided that no person should be liable to be summoned to take the oath of supremacy, or prosecuted for not obeying such summons; and Roman Catholics, upon taking an oath in which the civil and temporal authority of the pope are abjured, may hold office without taking the oath of

supremacy. Supreme Court of Judicature. Judicature Act, 1873, united the then Budicature Act, 1813, united the then existing Courts of Chancery, Queen's Bench, Common Pleas (q.v.) (Westminster), and Exchequer (q.v.), the High Court of Admiralty, the Probate Court (q.v.), the Court for Divorce and Matrimonial Causes, into one S. C. of J. in England. The old London Court of Bankruptey remained a security gourt until 1841 mained a separate court until 1884, when it became consolidated with the S. C. of J. by the Bankruptcy Act. 1883. The Supreme Court consists of two permanent divisions, the Court of Appeal and the High Court of Justice. The former in two divisions of three judges, each one of which is presided over by the Master of the Rolls (see PIPE ROLLS). The Lord Chief Justice, who is the head of the King's Bench division (q.v.), the president of the Probate, Divorce, and Admiralty division, and the Lord Chancellor (q.v.), are ex offico judges of the Court of Appeal, but never sit there, except that the Lord Chancellor sometimes sits on the opening day of a term. When necessary a judge of the High Court (see PUISNE JUDGE) may be called in when necessary. Except on questions of costs an appeal lies to the Court of Appeal from every judgment or order of the High Court, but only by leave from an inferior court (see INFERIOR COURT). The High Court of Justice exercises an origina

jurisdiction in all matters formerly He was conspicuous for his attacks dealt with by the old consolidated on English ships in the Indian seas courts, and an appellate jurisdiction from the counts. In this appellate jurisdiction the cases are heard by two judges sitting as a 'divisional court' for 'civil paper cases,' or by three judges for 'crown paper cases,' respectively. Bankruptcy and winding-up work are assigned to particular puisne judges, and the judicial functions of the Railway and Canal Commission to one judge and two commissioners. Admiralty cases are heard before a puisne judge or the president of the Probate, Divorce, and Admiralty Division, with or without the assistance of nautical assessors. The judges of the Court of Criminal Appeal are selected from the judges of the King's Bench division (q.v.), generally presided over by the Lord Chief Justice. The sittings of the Supreme Court are in the Strand, London (see ROYAL COURTS OF JUSTICE), but provision is made for administration of justice in the country by commissions of assize (reinforced in case of need by commissioners of assize, see Assize, GAOL DELIVERY, CIRCUIT, OYER TERMINER); any king's counsel on the circuit or a county court judge may act in this capacity.

Surabaya, an important seaport of Java, Dutch East Indies, at the mouth of the Kali Mas R. It has It has artillery workshops, and is the headquarters of the military authorities for East Java. Exports include cotton, coffee. rice, and sugar. Pop. (1905) 150,000.

Suraj-ud-Dowlah, see BLACK HOLE OF CALCUTTA and CLIVE, ROBERT

CLIVE, BARON.

Surakacta, a tn. of Java on the Solo. It is the centre of the Java railway system, and an important commercial emporium. It has the large palace or Kraton 'Susuhunan,' Pop. 120,000. of

Surat, a city of Gujarat, Bombay, India, cap. of the dist. of its own name, on the Tapti, 16 m. from its Once a great emporium, its importance has declined since the rise of Bombay, and the manufacture of silk and cotton goods are now the chief industries. There is an old citadel and numerous mosques. 114,863. The district has an area of 1660 sq. m., with a pop. of 635,000. Cereals and cotton are the main products.

Surbiton, an urban dist. in the Kingston parl. div. of Surrey, England, 13 m. from London. Pop. (1911)

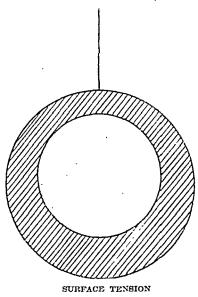
during the war and captured the Triton, 1785, and the Kent, 1800.

Surds, algebraical quantities the root of which cannot be exactly obtained. Thus the square root of 2, the cube root of 3, the fourth root of 4, are S, in that the quantity cannot be exactly determined. The above are written in algebraical notation as $\sqrt{2}$, $\sqrt[3]{3}$, $\sqrt[4]{4}$. S. are often called √2, √3, √4. S. are often called irrational or incommensurable quantities. The order of a S. is denoted by the root index, thus \sqrt{a} and \sqrt{a} are S. of the fifth, and nth order respectively. S. of the second order are often called quadratic surds. Two S. may be multiplied together, provided they are of the same order, by taking the same root of the product of the numbers under the root sign, thus $\sqrt{3} \times \sqrt{2} = \sqrt{3} \times 2 = \sqrt{6}$. The reciprocal operation also holds true $\sqrt{50} = \sqrt{25}$. $\sqrt{2}=5\sqrt{2}$, and in this way a S. may be reduced to one of a simpler form; when the S. does not admit of further reduction it is said to be in its simplest form. An expression involving two or more simple S. is called a compound surd; thus $3\sqrt{a}-4\sqrt{b}$ is a compound S.

Surety, see GUARANTEE. Suri, the foam and commotion of the sea breaking upon the shore or rocks.

Surface, in geometry. Imagine an infinite number of contiguous points in two dimensions and we have a S. That is to say, a S. may have length and breadth but no thickness. Any two contiguous regions in space must be separated by a S., and space itself must be bounded by a closed S. A S. is said to close if a point inside it cannot be joined to a point outside by any line without piercing the S. An open S. is bounded by a line. Any equation in three variables x, y, z represents a S. The latter is classified by the form of its equation. $x^3+y^3+z^3=1$ is called a cubic S. or one of the third order. A S. of the nth order is cut by any right line in n points, real or imaginary, and a plane cuts it in a line of the nth order. Investigators have dealt with Ss. of orders up to the third fairly fully, but no publication has appeared on Ss. above the third order. Cones, cylinders, and other Ss. which are cut out by a right line moving in some assigned manner are called 'ruled' Ss. See Sphere, Cylinder, Ellipsoid.

Surface Tension. Many phenomena show that liquids behave as if 17.713. Surcouf, Robert (1773-1827), a they were enclosed in a stretched membrane. Thus, if a bent wire is French privateer, born at St. Malo. covered with a film of liquid and a circle is the curve which has the largest area for a given perimeter. Thus, the liquid acts as if it possessed S. T. tending to make the surface assume as small an area as possible.



There is S. T. at the boundary of two liquids, whether they mix or no, and also at the boundary of a liquid and solid. It is commonly observed that a small quantity of oil on water spreads itself equally over the whole surface. This is due to the fact that the S. T. between water and air is greater than that between oil and water. Thus the greater tension on the clean surface of the water pulls the oil outwards in all directions, until the whole surface is covered with oil. For other effects of S. T. see Capil-LARITY.

Surf-bird, or Aphriza virgata, a species of Charadriidæ closely related to the turnstone. Its plumage is brown with white markings, and

the bird occurs on the Pacific coasts.
Surgeons, Royal College of. The periods there has been a nostile repractice of surgery was in the middle lationship between practitioners of ages chiefly in the hands of barbers, and in 1460 a company was incorporated to protect the interests of the savages of our own time. London barbers who practised as wounds are dressed, foreign bodies surgeons. In 1511 surgery was restricted by Act of Parliament to per-locations reduced, fractures set and

then a closed loop of silk thread sons qualified to practise that art, placed upon it and the film pierced and a Company of Surgeons arose who inside the loop, the film outside will amalgamated with the Company of pull the loop of silk into a circle. Now Barbers in 1540. In 1800 was established. Barbers in 1540. In 1800 was established the R. C. of S. of London, which became reconstituted in 1843 as the R. C. of S. of England. establishment of the General Medical Council in 1858 helped to regularise the two professions of physician and surgeon, and the work of the two colleges has from that time been The college grants co-ordinated. licentiate and fellowship diplomas and a special licentiateship in dental surgery. The building in Lincoln's Inn Fields possesses an excellent museum of anatomical specimens and other material cognate to the work of surgery. The R. C. of S. of Edinburgh was incorporated in 1505 and has buildings in Nicolson Street.

Surgery, that branch of the healing art in which operative measures are relied on. Strictly speaking, the science of medicine involves only those methods of procedure consisting of administration of substances the becoming incorporated which. bу into the bodily system, are expected to induce such changes as will lead to the diminution or cure of the disease. contradistinction, S., involves in actual manipulation of the part, either with the hand or with instruments. The term medicine is, how-ever, usually held to embrace the whole science and art of healing, together with contributory sciences. As knowledge of the human frame and of the agencies which affect it for good or evil extends, so does it become more difficult to treat of S. as a separate science or a separate branch of practice. The administra-tion of drugs as a therapeutic measure merges into inoculation with anti-toxic sera and other substances, and also into the application of such agencies as electricity, heat, cold, X-rays, etc. It is then not a long step to methods of treatment involving vibration, massage, etc., with a view to inducing changes in the chemistry of the body. Practically the only measures that are popularly regarded as surgical are those involving the removal of diseased parts and substances foreign to the normal organism. Although modern practice in medicine and S. has many interconnecting features, the two arts have a separate history, and at some periods there has been a hostile re-

bound, while in desperate cases am-, ties. putations are resorted to. Experience quickly shows the barbarian that a diseased part is a pain and a danger, and that the natural recuperating powers of the body are aided by the removal of a desperately diseased The early civilisations of Egypt, Greece, Mesopotamia. India, and China found a place for the surgeon in their social organisation, and such operations as incisions for the removal of dropsical fluids, amputations with subsequent treatment of tions with subsequent treatment of
the stump with boiling oil or pitch,
the removal of concretions from the
bladder, etc., seem to have been
practised at a very early period. The
science of S. was transmitted to
Europe by Byzantine writers, and
somewhat later by practitioners who
followed the Arabian tradition. The
the surgeon's
to the monas-

to the monas-

of books of a scientific character enabled the clergy to minister to the needs of the vulgar. As with medicine, however, monastic surgical science became impregnated with what would now be called super-The lancet was the only instition. strument in common use, and the practice of bleeding for any and every complaint was controlled by the observation of the changes of the moon and such phenomena. For some and such phenomena. reason the monks were interdicted from the practice of S. in 1139 and again in 1163, but the interdict was not wholly effective. In 1540 the two callings of barbery and surgery, formerly practised by the same indi- in the Thames valley, and medicinal separated. viduals, were the same guild control Throughout Tudor and St surgeons shared the of physicians and were fave

the confidence of the higher classes. The greater power of the physicians organisation enabled them to restrict the practice of surgeons, and it was enacted that no major operation, that is, an operation involving danger to life, should be attempted without the presence of a physician. In 1745 the surgeons seceded from the Barber-Surgeons Company and formed the Poyal College of Surgeons (2018) Royal College of Surgeons (q.v.). With the more efficient organisation and the improved methods of surgical education the profession improved considerably in status. In the 19th considerably in status. In the contury progress in anatomical know-ledge led to the tendency to specialise which is still operative. The introduction of anmesthetics greatly enlarged various parts of the county, and the conturn of S. Antual: the scope of S. Actual: of smaller importance, a ledge resulting from methodical operations wider range of surgi

The inauguration of antisepte methods by Lord Lister is on the whole the most important item in the events of surgical history. The mortality due to operative infection diminished enormously, and surgical methods have gained the confidence of a much wider circle. Sec LARYNGO-SCOPE, X-RAYS, CYSTOSCOPE, etc.

Suricate, sec MEERKAT. Surinam, see DUTCH GUIANA. Surinam Toad, see AMPHIBIA and Pipa.

Surplice (Lat. superpelliceum, above the fur dress), a loose white linen garment with wide sleeves, worn over the cassock by clergy and certain of the laity at choir offices and at certain other times.

Surrender, see Capitulation.
Surrey, a S.E. co. of England.
lying S. of the Thames, and bounded W. by Berks and Hants, E. by Kent, and S. by Sussex. It is about 40 m. from E. to W., and about 27 m. from N. to S., with an area of 682 sq. m. and a pop. (1911) of 919,977. Its surface is greatly undulating but hilly in parts, notably at Leith Hill (967) ft.), Box Hill, Hindhead Hill, and Richmond Hill, from which splendid views of the surrounding scenery can be obtained, the North Downs skirt-ing its S. boundary. The soil differs considerably in its extreme parts from the centre of the county, where there are wide sandy or chalky tracts and barren heath. On the outskirts of the county the soil is rich, and is mainly under corn and grass. Market gardening is extensively carried on

wn. Hops are culent, and fuller's e neighbourhood

the Thames the v the Mole, Wey, and Wandle. The chief towns are Croydon, Kingston, Reigate, Guildford, Farnham, and Woking, which have various industries, but the bulk of the manufactures are carried on within the limits of Greater London. There are fine gardens at Kew, which contain an important observatory. The county is represented in the House of Commons by six members. The most important events in the history of S. are the defeat of the Danes by Ethelwulf at Ookley in 851; the crowning of seven Saxon kings at Kingston between 901 and 978; and the signing of the Magna Charta by King John in 1215. Traces of

Castle, Guildford Castle, d castle built by Wolsey on uk of the Mole at Esher, and s of Waverley and Newark,

His life

Cox's | friend of Sir Walter Scott. Sec J. also in ruins. C. E. Parker's has been written by George Taylor in Surrey. ild's Surren , 1901.

Surrey, Henry Howard, Earl of (c. 1517-47), an English poet, the son of Lord Thomas Howard, afterwards Duke of Norfolk. He was earl marshal at Anne Boleyn's trial in 1536, and the same year accompanied his father against the Yorkshire rebels. He took part in the unsuccessful siege of Montreull in 1544, and when commander of Boulogne from 1545-46 was defeated at St. Etienne. He was imprisoned on a charge of treasonably quartering royal arms, and executed on Tower Hill. S., with Wyatt, introduced the sonnet from Italy into England. He was also responsible for blank verse in five iambie feet, his translation of the Eneid (reprinted 1814) introducing it. His Description and Praise of his Love Geraldine, together with forty other poems, was printed in Tottel's Songes and Sonettes, 1557 (reprinted 1867 and 1870).
Surrey, Thomas Howard, Earl of

Surrey, Thomas Howard, Earl of (1473-1554), also held the title of Duke (1473-1554), also held the title of Duke of Norfolk. He took part in the battle of Flodden in 1513, and as wardengeneral of the Marches devastated the Scottlish border and forced Albany to retreat in 1523. Having already held the positions of lord-lieutenant of Ireland from 1520-21 and lord treasurer in 1522, he was made earl marshal in 1533. He was hoveyer, ousted from favour by however, ousted from favour by Hertford and condemned to death, but Henry VIII.'s death prevented his execution, and on Mary's accession he was released.

· Surrogate. An ecclesiastical judge may appoint a duly qualified deputy called a S. to act for him, but the authority of a S. cannot exceed that of his principal. According to Canon 128 a S. must be 'either a grave minister and a graduate, or a licensed public preacher, and a beneficed man near the place where the courts are kept, or a bachelor of the courts are kept, or a bachelor of law or master of arts at least, who hath some skill in the civil and ecclesiastical law, and is a favourer of true religion, and a man of modest and honest conversation, and any chancellor, commissary, or other ecclesiastical judge who appoints a non-qualified person as his S. is liable by the same canon to suspen-sion and censure. See Phillimore's Ecclesiastical Law.

Surtees, Robert (1779 - 1834), a scholar and antiquary, author of the History of Durham, whose name is commemorated by an antiquarian society bearing his name. He was a has for its object the attainment of a

(1852).Surtees, Robert Smith (1803-64), a novelist and creator of Jorrocks, the

sporting Cockney grocer whose amusing adventures are told with racy wit ing adventures are told with racy with in Jorrocks' Jaunts and Jollilies and other volumes. S. was articled to a solicitor, and duly qualified, but money came to him from the death of a relative, which enabled him to give himself up to the life of a sporting gentleman with journalistic and liter-He founded The New ary tastes. Sporting Magazine.

Surturbrand, a geological formation found as scattered masses among the basalts of Iceland. It consists of clay in which is embedded masses of woody material, rendering the whole

woody material, rendering the whole suitable for a rough kind of fuel. ... Survey, Courts of. These are courts created by the Merchant Shipping Act, 1876, and their primary object is to prevent unseaworthy or overloaded ships from going to sea. The Merchant Shipping Act, 1894, which replaces the above Act, provides for the constitution, powers and prothe constitution, powers, and pro-cedure of C. of S. By these provisions a C. of S. for a port or district is to consist of a judge, sitting with two assessors (see remarks on expert witnesses under EVIDENCE). witnesses under Lyderolp, The judge may be a county court judge, metropolitan police magistrate, or other fit person, but where the Board of Trade appoint a wreck commissioner the latter is chosen as judge. The assessors must be persons of nautical, engineering, or other special skill and experience. Cases must be heard in open court. The functions of the court are to act as a court of appeal from the decision of the Board of Trade as to the seaworthiness of any particular ship. It will be seen on reference to the article MERCHANT SHIPPING ACT, that if the Board of Trade believe a ship to be unsafe on account of defective condition of hull. equipment, or machinery, or by reason of improper loading, it can detain the ship either on conditions or absolutely. The judge and each assessor is entitled to survey the ship and enjoy for that purpose all the powers of a Board of Trade inspector. The court also acts as a court of appeal from the refusal of a certificate for clearance of an emigrant ship and in other matters. Where the Board of Trade think that an appeal involves a question of construction or design, or of scientific difficulty or important principle, they may refer the matter to scientific referces approved by a Secretary of State. Surveying and Levelling. Surveying

portion of the earth's surface in such a manner that they may be plotted on a map or plan to some scale. Levelling, a branch of surveying, as-certains the relative vertical heights of points with regard to some datum level, such as mean sea-level. simplest form of surveying may be

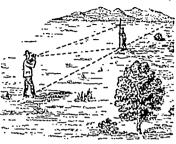


called property surveying, which concerned with quite small plots of When boundaries are rectilinear the chain (Fig. 1) is the chief instrument. In Britain two forms are used: Gunter's and the 100 ft. They are made of stout iron or steel wire, and contain 100 links. Gunter's chain is 66 ft. or 4 poles long, each link being 792 in., and is adopted for

most work except small town quite It has assumed a definite pattern and is marked at every ten links by differently shaped tablets: brass at each end is a convenient brass handle. most other countries the decameter chain is used. With each chain ten or arrows iron skewers are carried place in to ground at each chain length. Where the lines to be measured are not rectilinear, the chain is used to line from give \mathbf{a} which 'offsets' may be measured (Fig. 2) to important points by means of the

FIG. 2 offset staff, of ten links' longth, total 6 ft. 7.20 in. To mark out lines flagged poles, 10 to 20 ft. long, are used; ranging rods, often of the same length as the offset staff, painted over lt is further usual to arrange ties each tenth with different colours, are or lines across the triangles, the inalso carried, together with bundles of tersections forming useful checks to laths; whites or thin sticks, 15 in. to 3 ft., with clefts for paper, to be used for small ranging; and a 33 ft. tape. It is usual to assign these implements lines; the lines are produced forming

mathematically accurate idea of the party, and carefully to organise, in relative positions of all points on any every detail, the routine work. In using these instruments, all measure. ments must be horizontal, not follow unevenness of the ground, since they are finally plotted on a plane surface. If the unevenness or slope is not great, stepping is the simple method adopted, the chain being stretched to the horizontal, its raised end being



projected on to the ground by means of a plumb line; when greater, the angle is taken with an Abney level or clinometer, as shown in Fig. 3. main lines of measurement, or base lines, should be central and intersect one another, thus giving checks: within the net thus marked sub-sidiary chain lines are taken, forming triangles. Where possible, as in towns, rectangles may be laid out, but in general the triangle is the figure its dimensions being easily plotted. checked by calculations from simple

nearer al, the roided.

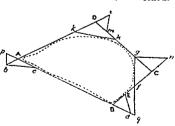
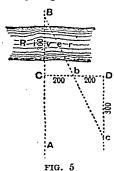


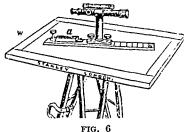
FIG. I

the other measurements. Fig. 4 shows a method of measuring an inaccessible interior area by surrounding chainto definite members of the surveying chain-angles; the angles A, B, C, D

the angles. The true outline of the area is then found by offsets from the principal lines. It should be clear that great saving in labour may be gained by a careful reconnoitre of the area to be surveyed; there is always a simplest accurate design. vices are innumerable, but one may be illustrated in connection with inaccessibility. Fig. 5 shows a method

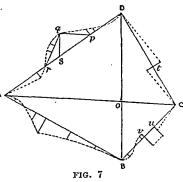


of finding the distance across a river between the stations B and C; the triangle BCb has a right angle at C and Cb is measured; Cb is produced to D and bD made equal to it; Dc is set off at right angles to bD and c obtained by sighting through b to B. It is clear that Dc=BC, the distance which cannot be chained. There are two great difficulties in chain and uneven ground and inoffset work:



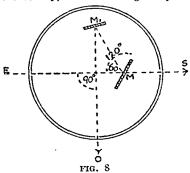
accessibility, and the labour in covering extended distances. To obviate triangulation is resorted to these. completely; any measurements are taken which will enable the complete determination of the triangle (see Trigonometry). Some means of TRIGONOMETRY). Some means measuring the angles is employed, the simplest of which is the use of the Plane table, a good form of which is shown in Fig. 6, though the telescope is often replaced by slotted sights at

are checked by the tie lines shown at the ends of the ruler. A trough compass, a, to give the magnetic meridian, and spirit level are provided. From any station, a sight to a distant station can be taken and its direction ruled immediately without reading



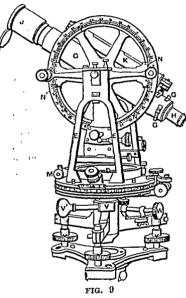
off the angle. Fig. 7 illustrates the survey of an irregular area, the principal lines ABCD being the figure rectilinear approximation checked by the lines AC, BD.

Field Book.—All observations are here entered while in the field. Everything is arranged for ease of entry and computation afterwards, but particularly so that easy checks are provided as the work of observation proceeds. On the organisation of the field party and that of the observa-tions entered in the field book de-pends the rapidity and accuracy of the survey, and much ingenuity is



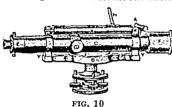
shown in methods which eliminate personal error and reduce the chance of mistakes to a minimum. In large surveys the field book is despatched to headquarters, where it is used by draughtsmen in the plotting of the maps, the actual observer not being consulted. formity in the plan of field books.

The use of instruments for angular measurement, while lessening the difficulties and labour of chain survey, has its own troubles. Portability is an essential to such instruments, and great refinements are necessary in their construction if accuracy is to be secured, and a small inaccuracy in angle may mean quite a large and impermissible one in linear measurement. For this reason, the cross-staff with sighting slots has largely gone it is a cylindrical or out of use; octagonal box on a rod, and has slots to give sights of 90° or 45°, and some-times has its upper part capable of rotation, a scale showing the angle.

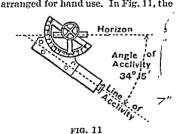


The optical square (Fig. 8) gives a right angle, as required for offsets; a sight is taken along the chain line ES through the lower unsilvered part of M, placed at 120° across ES. The mirror M, is placed at 45° to E, and by walking along the chain line
ES until the object O is reflected
from M and M, appearing exactly
over the direct image of S and then to the eye, the rectangular position of O is obtained. An angle of 180° is required to determine when the observer is exactly in line between two flags; for this purpose a lineranger, consisting of two prisms, are simultaneously visible, the height

This necessitates uni arranged, as shown, in the centre e plan of field books. piece of the Marindin telemeter (a.r.), is used: the true alignment is obtained when the images of the flags coincide. Of all instruments the theodolite is the most complete, its arrangement of a telescope on a vertical circle on which it rotates as a diameter, these being mounted on a horizontal circle, allows any angle from a point to be taken for all points of the compass and for a large range above or below level. Fig. 9 shows one form of the instrument resting on its levelling screws on a tripod. movements are controlled by screws: spirit level and compass are mounted and the graduations on the two circles

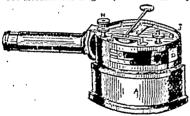


read in conjunction with verniers by means of microscopes. Practically all other instruments are more handy forms, and more limited in utility. The dumpy level (Fig. 10) is one form of instrument used for levelling only, rotating horizontally on B. clinometer is used for taking angles of elevation or depression, and is cleverly

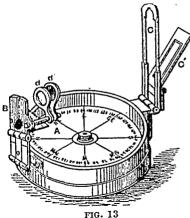


most popular form, the Abney level is shown in use; the telescope carries two quadrants fixed to it, a spirit level being capable of rotation round the middle of their common diameter; the level has an arm projecting into the graduations of the quadrants, and reading is carried out with the help of a vernier. The bubble of the leve when central is visible through the telescope by reflection from a mirror, so that when the object and bubble

for horizontal angles; for its theory



see Sextant. Fig. 13 shows the prismatic compass; it carries a magnifying prism and sighting arrangements B and C. and silvering on the prism slope reflects to the eye the gradua-

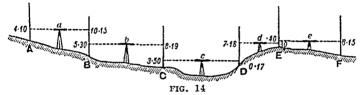


above horizon is shown on the scale, patent devices for labour-saving and Another handy instrument, the box convenience, or for special work, such sextant (Fig. 12), is very largely used as curve-ranging, are added. The immediate advantage οf angular survey is in the lessening of ties and checks in the triangles, the summing of the angles to 180° giving practically all that is necessary. It is customary. therefore, to start from a very carefully measured base and rapidly to cover with . compatible iole area to be of each triangle are then worked out by

chain survey. For property surveying, steel or 'Invar,' steel with 38 per cent. metal, tapers or wires of 100 ft. or twenty-four metres are used, its co-efficient of expansion being than one-tenth that of steel. have the further advantage over rods in that wound on reels they can be despatched by post for testing to the National Physical Laboratory, etc. Base-line Measurement .- Two stations are selected, slightly elevated for convenience of sighting other points, from 4 to 12 miles apart. Terminals are sunk here, pillars erected firmly, and the ends of the base-line marked thereon. Between these firm tripods carrying small pillars are aligned, at equal distances. convenient for each tape measurement. The tape is stretched between these in turn, over frictionless pulleys, by means of weights suspended from training trestles; an accuracy of in 200,000 is obtainable, and is sufficient for all topographic work.

Levelling, in the simple form, is carried out by means of the Y or dumpy level, which is merely a tele-

scope, with cross-wire in its focal plane, capable of movement in a horizontal plane which is determined by means of a sensitive spirit level Fig. 13 usually mounted over the telescope. Any object seen on the cross-wires is traversing the instrument is particutraversing the instrument ing, without adjustment, it gives the it is marked in feet, tenths, and hunbearing of an object, i.e., its angle dredths from the bottom upwards.



with the magnetic meridian.

The The telescopic form in three sections telemeter (q, v) is also used for rapid is generally used. Simple levelling is work over short distances. Many of carried out by arranging the telescope the above instruments are combined; in line equally between two such the patterns are innumerable and staves; the back-sight, or reading on

the last staff passed, is taken, and then the instrument is rotated through 180° for reading the fore-sight, when the difference in reading gives the difference in level between the feet of the staves. It will be observed that this observation is independent of the height of the telescope cross-wires of checking is obvious.

Back-sight	Fore-sight	Rise	Fall	Reduced Levels	Remarks
4:10 5:30 3:50 7:18 0:40	10·15 8·19 0·17 0·30 6·15	3·33 6·88	6.05 2.89 5.75	20.00 13.95 11.06 14.39 21.27 15.52	Below at A At B C D E F F
20.48	24·96 20·48	10.21	14.69 10.21	20·00 15·52	
	4.48		4.48	4.48	

A BACK SIGHT STAFF B FORE SIGHT STAFF

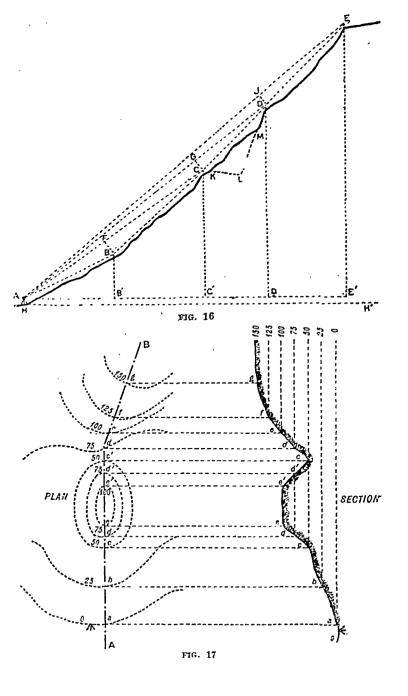
Where natural objects are observed | Contouring delineates on a plan as a base from which to commence | series of lines of equal altitude, or levelling, a level mark, of crow's foot lines of intersection of a hill by horiform, is cut. Fig. 15 shows another zontal planes. Fig. 17 shows a section which is traversed with the level, the vertical intervals being obtained by

r measurement. be obtained by

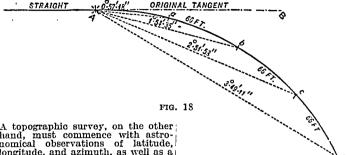
sections normal to the contours when plotted, or at each level on the original section the contours may be worked round by staff and level, the former being moved up and down the slope till the desired level is obtained. A peg is driven in here and the process continued. Setting out curves is a form of work often required. For this the theodolite is chiefly used. The radius of curvature having been determined, a point may be taken in the line from which the curve springs. Back and fore sights having been taken, the angle of the theodolite is set to give the chord, the length of which would be I chain. This is found by calculation or taken from tables. The series is taken as shown in Fig. 18. Two theodolites are often used, and the curve set out from opposite ends.

Heights.—Fig. 19 illustrates

method of obtaining height BC by means of a theodolite, where a base AD is awkwardly placed, the foot of the object being invisible from A. For the method of solving the triangles see Trigonometry. In this case angles CDB, CDH are observed from D, and the height of instrument DF above the peg measured. From E the angles CAD, DAH are observed A, A' and B, etc. Fig. 16 sufficiently Thus CDH+HDA=CDA. In the shows the method of angular levelling with the theodolite. AD is awkwardly placed, the foot



angled triangle CHD. 90°-D=C the base line is then measured by In the triangle CBD, 180° -(C+D)= tapes with accuracy, and the theo-B and $\sin B:b:\sin D:d$ and d=CB. dolite takes the place of the plane Topographic Surveying.—A simple table, all attention being now given land survey as a rule gives no reference to the exact position on a map of the country, nor is it concerned to read the scale by means of a with anything beyond relative level. micrometer microscope (see Transit



hand, must commence with astronomical observations of latitude. longitude, and azimuth, as well as a determination of level relative to mean sea-level. The last is taken by observation of tide-gauges over an extended time, and can be carried inland by the ordinary process of levelling. Before determining the Before determining the levelling. base-line stations, it is usual to carry out a plane-table reconnaissance, dursame time station points are determined and beacons erected, or suit-

19 FIG.

angulation will have been determined; station, afford a means of determining

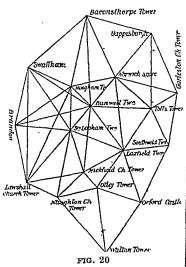
INSTRUMENT), accuracy being creased five-fold. Observation of Latitude—This may be made at any point in the triangulation, and except for geodetic purposes it is not usual to fix more than one station astronomiout a plane-table reconnaissance, during which many unforeseen troubles are discovered and avoided with the the usual one is by observation of a later theodolite operations. At the star's altitude when near the meridian; this is repeated for two or three nights and with different stars, both able objects chosen as beacons. Any N. and S., and accuracy should be obtained to one or two seconds of arc. Observation of Longitude.—Local time is obtained by observation of pairs of stars E. and W. as near the prime vertical as possible; Greenwich time may be obtained from the mean of several chronometers, or by telegraph, which is practically the only method now used. Wireless telegraphy, where possible, will give it correct to considerably less than one second of time. Observation of the other meaning of the other than the print of the other than the other of the other than the other of th second of time. Observation of Azimuth.—This, the true bearing, or angle between the prime vertical and meridian with respect to the line chosen for determination, is obtained by observations of a circumpolar star or one near the prime vertical, and a suitable image for reading with the cross-wires of the theodolite, but lease of centering is important; i.e., often more convenient to take the point vertically below the mark on the beacon must be easily and correctly determinable. On this point the station mark must be placed in such manner as to be permanent. The reconnaissance completed, a careful scheme of triangulation will have been determined; station, afford a means of determining by observations of a circumpolar star

accuracy of two or three seconds of arc being obtainable. Theodolite Triangulation.—From any station a round of angles is taken between A and B, B and C, and so on to G and A, so that A is observed twice; by this means a check is placed on the angles as their sum should be 360°. As a further check the round is taken several times. If this cannot be done directly owing to weather, for instance, it is done indirectly by erecting some reference mark easily visible. The measured base is 'reduced to sealevel,' since maps are projected on to one plane, so that the remainder of the triangulation obtained by angles is automatically reduced to the same level. Modern base-measurement being a comparatively easy process. the results of theodolite triangulation are fairly often checked by chaining. are fairly often checked by chaining. In small triangles, with sides of one or two miles, the sphericity of the earth is negligible; in larger triangles this is shown on the readings, the three angles being more than 180° in sum. This spherical excess, depending on the area of the triangle, sum. is easily calculated and forms another check. When subtracted from the sum, the difference between the result and 180° is known as the triangular error, and may be as much as two or three seconds in good topographical work. Spherical excess Is given by the formula $E=ab\sin C$ cosec $1/2r^2$, but simplified formula are used for most purposes. One of the greatest difficulties is in connecting the support of the connection of the support of t tion with refraction; as this usually is supposed to act in a vertical plane it does not generally affect the horizontal angles, except with 'grazing rays,' which should be avoided. These are lines of sight passing close to steep slopes, where there is usually a horizontal temperature gradient. Vertical refraction in a horizontal ray is impossible to calculate: it may be avoided largely by observing in the carly afternoons when it is a minimum, and by back-sighting, which eliminates it, if the conditions of the two observations are the same. Otherwise it must be corrected by calcula-tion or reference to tables, a partial remedy only. The surveyor, when experienced, will determine it by experience, aided by a careful analysis of his readings from all other points. Over a ray of 30 m. the error may be two or three feet with backsight; it is more when one observation only is relied on, and very uncertain indeed, in mountainous regions, or over water, sand, or snow. It may, however, be noted that a vertical angle taken from the level vertical angle taken from the level a more scientific datum is being has only one reading error, whereas obtained off Cornwall and in the

the true azimuth of the station, an a horizontal angle has two. A great accuracy of two or three seconds of deal may be done in checking errors by the careful selection of the second and following chained lines. In more accurate topographic survey system of triangulation is worked up sequences of quadrilaterals. equivalent to tving the triangles. which gives regular checks. graphical position of stations may, in graphical position of stations may, in less extended surveys, be obtained graphically by carefully plotting the base, astronomically determined, on a plane-table graticle, or sheet with the latitude and longitude ares constructed according to the methods of map projection; if the corrected angles are plotted on the graticle, the stations will fall in their true geographical positions. In more extended work this is done by calculation, the computation having been greatly simplified in the tables of the survey of India. Levelling with the theodoof India. Determine when the checked lite follows the same principles as for simple survey, with the addition of the important original linking up to mean sea-level.

Ordnance Surveys .- The origin of ordnance surveys in Britain was due to the 1745 rebellion in the Highlands; the map was so useful that it was extended to the Lowlands, with the idea of finally covering the whole kingdom. In 1783 the French ambassador proposed the linking up of Greenwich and Paris by triangulation, and the scheme was put into operation. base was measured on Hounslow Heath and the survey was taken to Dover. Connection was then made with Boulogne, Calais, and Dun-querque. This led to the principal triangulation of the United Kingdom which occupied the first half of the 19th century. The base was laid out on Salisbury Plain and measured with steel, glass, and wooden rods; triangulation was proceeded with over the whole country, not by the modern method of chains of triangles along meridians and parallels; con-nection was established between Wales and Ireland by the invention of the lime-light; N. of Scotland the two islands Faire and Foula made it possible to extend to the Shetlands. No base was measured in Scotland, but another was laid out by Lough Foyle, compensating bars being used. The triangles were broken up into smaller ones averaging a little over a mile a side, and these were all chained over, even the contouring being done by chain. These contours, although accurate, are too far apart. The trigonometrical survey occupied about sixty years. The datum level was mean tide level at Liverpool, but

North Sea. A base has since been measured at Lossiemouth in Scotland, and checking from it is proceeding. Fig. 20 shows the triangulation of Norfolk and Suffolk. India.—The survey here has been of the highest standard, and has contributed enormously to the advance of geodesy. Australia and Canada are carrying out a complete geodetic survey. S. Africa, the geodetic survey is complete; the topographic survey of the Orange Free State has been carried out, but not that of Natal, Rhodesia, Transvaal, or the Cape, though the reconnaissance is partially done in the last named.



Tropical Africa is further advanced under the control of the Colonial Survey Committee (1905); this body has extended its work to colonies and dependencies. Boundary surveys are largely completed Africa, 10,000 out of 17,000 m. having been delineated chiefly during the last fifteen years. The Alaska boundary, and that between Chili and The Alaska boun-Argentina, are instances of extremely careful work.

Route traversing has become an important branch of surveying, since it is often carried out with great labour, patience, and skill. It consists in careful observations of the route taken by an explorer, whereby his journey may be accurately laid down, and in the plotting of as much of the lateral feature as he is able to

Dr. Sven Hedin in Tibet is a model of this type of work. In the past much error has crept into maps, notably in Africa, owing to faulty instruments and inaccurate observations of the astronomical data for selected stations route. The improvements in instruments and the encouragement by the Royal Geographical Society have led to much more accurate work. The explorer nowadays checks his route by astronomical observations as in topographic survey, and usually carries several chronometers. Be-tween stations he keeps a sort of dead reckoning. Distance may be measured by cyclometer or perammeasured by cyclometer or perambulator, a wheel of known circumference, often 10 ft., mounted in a fork and handles, and fitted with counting mechanism to give the number of turns; the sledge-meter used in Antarctic expeditions is a form of this. A bicycle may be so form of this. A bicycle may be so Distances measured this arranged. way have to be corrected for windings of the path and for inequalities of level up and down hill, etc. The experienced explorer usually relies on his own experience, together with the time taken to traverse the distance; he knows pretty accurately his own marching pace, the pace of his animal, of his party or baggage train. His chief difficulty lies in estimating rate up hills and down, particularly on slight almost imperceptible gradients. Windings of the path, nature of surface, weather, etc., are all sources of error. His traverse, or connected series of straight lines, has to be watched in its various bearings, which is usually done by means of a pris-matic compass. Fixing on a distant objective he takes its bearing, and on reaching it repeats the process for another objective. This again is very difficult in hilly and forest land, particularly the latter. A portable theodo-lite is often carried and enables him to check his result to some extent two or three times in an extended journey. When he crosses the route of a previous explorer he may check by that, if, as is usual, he has previously obtained the records. Meanwhile he tained the records. takes the bearings of distant and near landmarks from several points along his route, such cross-bearings forming another check on his traverse. keeps a field book in which all these are entered, together with details of things he wishes to remember on either side of his track, e.g. forest, cultivation, swamp, etc. The most cultivation, swamp, etc. The most prominent distant features he will observe with the theodolite with greater accuracy. His astronomical bearings may be obtained within a mile by sextant, much less by theodoobserve while travelling. The work of lite, for latitude. For longitudes his

chief difficulty is Greenwich time, errors in the experiments, but the necessitating the carrying of several determinations carried out in Peru chronometers; in any case, however much care is taken, the rough journey, the joltings, and carelessness journey, the joitings, and carelessness of native bearers may render them all unreliable. The errors of these may be checked, but with difficulty and laborious calculation, by observations of occultations of stars by the moon; the infrequency of these is a difficulty. With the sextant he may measure lunar distance, the distance between a star and the moon, but with less accurate results. His compass bearings are not true bearings. since the needle varies in deviation from place to place and time to time; these must be checked by observations of azimuth, the difference be-tween which and the compass bearing gives the deviation. It necessitates a knowledge of approximate latitude, the horizontal angles of the sun and a distant object, and the altitude of the sun. The true azimuth of the sun is known from its altitude and the latitude, and by applying to this the horizontal angle of the object, its azimuth is determined. However careful and skilful the traveller may be, his route traverse is never accurate enough for correct maps. The process of levelling reduces itself to rougher methods than those of true surveying. The aneroid barometer is a usual means, but as it is affected by temperature and other weather conditions, as well as by height above sea level, only a very rough approximation can be made. If one be taken to the height required and another be kept in camp, simultaneous series of readings will give a better result. In parts of the world where variations are or the world where variations are practically quite regular, the results of single observations may be relied on, e.g. Southern Nigeria. The hypso-meter, or boiling point thermometer, is an instrument much used, and gives somewhat less accurate results than the ancroid. The heights of mountains by these methods are given by various travellers with differences of several hundred feet.

Geodesy has for its aim the measurement of the earth considered as a nearly spherical body. Eratosthenes in the 3rd century B.C. measured the arc of a meridian in stadia, and by simultaneous observations of the sun's declination obtained the angle subtending this are at the earth's centre, from which he calculated the earth's circumference. For a difference of n' latitude, and a distance M along the meridian between the two stations, the earth's radius=M cosec

determinations carried out in Peru and Lapland under the auspices of the French Academy, 1735, showed clearly the increasing lengths of degrees of latitudes the further N. they are taken. These appeared to give the shape of the earth as a spheriod of revolution, the meridians being equal ellipses. Lacaille, however, found, at the Cape, that the length of the degrees decreased; shortly after in England a similar decrepancy was noted. But it was shown that the discrepancy was due to the fact that the direction of to the fact that the direction of gravity varied with the irregular distribution of mass in the earth. At a place where the vertical does not point to the centre of the earth, the horizontal which is perpendicular to the vertical is not a true tangent to the spheroid. Mountain masses deflect the vertical, but the amount can be calculated, but the allowance made does not give the result expected. At Dunnose, Isle of Wight, the vertical does not deviate towards the high down to the N., as might be expected on account of the attraction of its mass, but towards the S. The problem has been of greatest moment in the case of the Himalayas, and in 1860 Archdeacon Pratt showed that the deviation of the pendulum was not as great as the mountain masses might be expected to produce. The attraction at any point of a spheroid can be represented by formula, and the swing of a pendulum in consequence predicted. In the same way, by observing the oscillations of a pendulum in all parts of the earth, we may calculate its shape. This is, therefore, an alternative method to of its mass, but towards the S. therefore, an alternative method to the triangulation of arcs of meridians. The results of the observations are peculiar; on the tops of mountains the pendulum should be subjected to a calculable lessened force of gravity, increased by the effect of the moun-tain mass, which can also be estimated; yet actually the latter appears to produce no effect. Again, there is a similar compensation in the case of oceanic islands according to Faye; Hickes has confirmed this by simultaneous observations on the ther-mometer and barometer at many places throughout the world. Curious results were obtained in India; the pendulums swung at Kew gave a mean time of 0.5067001 sec.; swung at Dehra Dun the time was 0.5072528 sec., thus losing about 1 swing in 10,000. This gives the value of gravity along the meridian between the two at Dehra Dun as 979°063 om. as comstations, the earth's radius=M cosec | 1″/n. In the 17th century several attempts were made to determine level and for 'visible mass' gives this, with confusing results due to 979°198. Theory (Helmert) gives

600 ft., it were been tested yet. Such facts show that the geodetic amplitude of an arc of meridian determined by triangulation would not accord with that obtained by the method of Eratosthenes. discrepancies in Britain varying from -2"19 to +1"95; in India from -3"69 to +3"87. As 1" lat. corresponds to about 100 ft., the two methods will give results utterly discordant. To determine a figure for each latitude will give an equation, determined as follows:-

979'324 cm., so that instead of allowing for a mass 2200 ft. high, it is as if a series of equations result, which a depth of 3600 ft. existed; there is a large deficiency of gravity. S. of the squares, giving the values of corrections which reduce the sum of the of deficient density' is similarly squares of the residual differences to a square of the residual dif found. Colonel Clarke calculated that minimum; i.c. the correction is found the attraction of the Himalayas which produces the best mean beshould of tween geodesy and astronomy over the arc. The practice of geodesy, apart from the use of the pendulum. is the same as that for topographic survey, but with every possible refinement science can bring to bear on instruments and the elimination of errors. Recent work has been the and this is found to be so; there are remeasurement of the Peruvian are discrepancies in Britain varying from by the French military authorities; the measurement of an arc in Spitzbergen by Russians and Swedes; an attempt is being made to link the surveys of India and Russia in Asia: Egypt is pushing its survey south-wards. U.S.A. and Canada are exwhich would lessen the discrepancy, wards. U.S.A. and Canada are exaculation is made of the effect of a definite change in the assumed Mexico and Chile in the S. The elliptic axis of the earth. The change

1	Equatorial Semi-diameter	Flattening	Polar Semi- diameter
Bessel (1841)	6,377,397 m.	1/299·2	6,356,079 m.
	6,378,206	1/295·0	6,356,584
	6,378,249	1/293·5	6,356,515
	6,378,388	1/297·0	6,356,909

Tacheometry.—In country difficult different distances. The correction for ordinary traversing the tacheometer may be used for the method of made by adding to the computed subtense measurement. At one end distance, the distance from the centre of the ray to be measured to

about 50 yds. apart are pl

right angles to the ray, their apart being accurately m These are observed through the theodolite and the angle subtended measured; representing the angle by 20, the distance between the poles by 2s, then the length of the ray = s tan θ . Another method for shorter rays is to use a theodolite with two wires at fixed distances apart on the field, and observe, along the ray, a graduated staff. The wires always give a fixed angle which will enclose more or fewer graduations on the staff, the farther or the nearer it is respectively. The stadia marks, as the wires are called, are so arranged that the graduations have only to be multiplied by a factor to give the distance of the staff from the observer. This factor varies with the distances of the wires from the optical centre of the objective of the telescope which is changed in altering the focus for a traverse along the coast.

meter is an instrument which, by the introduction of a third lens in the telescope, the anallatic lens, eliminates the correction and gives the reading at once. The instrument is useful for small surveys and military work, but not for extended surveys. When used on the slope, if the graduated bar is horizontal, the computed distance must be multiplied by the cosine of the slope to give the horizontal distance; if vertical the multiplier is the square of the cosine.

Nautical surreying carried out by ships along the coast depends on the same methods of observation and triangulation. In coast-lining a shore party carries out the usual methods in conjunction with the ship. are so placed that their bearings can be taken from the ship which makes

of inshore depths, determination the particularly high-water line, which is often done from boats at anchor. Where stations are required in water, special methods are naturally required, and it is in these methods of carrying out the work at sea that

nautical surveying differs. Hydrographic surveying deals more particularly with the area and depths of water stretches, at sea, a lake, or river. It includes the linking up with the shore triangulation, the mapping of the margin, but particularly the sounding of depths. These are found by ordinary sounding operations carried out by a boat directed from the shore. When the water is of sufficiently small extent, a cable may be stretched across and the sounding carried on from the shore by means of a sounding line attached to the cable. The methods of determining the position of the boat from the shore are numerous, but there are different ways of selecting rays parallel and intersecting. In the case of a lake, it is merely the process of contouring by means of sounding. Such a survey often includes temperature observations, salinity, velocity, current, tides or soiches, transparency, etc.

Mine surveying is another branch with its special methods. The linking up with surface survey is important; the first point is the fixing of the position of the upper and lower ends of a weighted wire let down the shafts, when a traverse from one to the other will give the basis for a complete survey and connect the underground with the surface. If one shaft only is available two wires may be suspended, thus giving short base lines above and below ground, the relative positions of which are known. Underground there is the necessity for special illuminations, and there is more use of magnetic bearings. Stations are usually marked in the roof, and pendulums suspended for centering, the telescope being marked on the top. When a mine is entered by tunnel or sloping shaft, the surface survey can be carried down without trouble. The mine surveyor is naturally always extending, and his observations must include all that are necessary for following the beds of coal correctly.

Photographic Surveying.—In this method, first suggested by Colonel Laussedat, a French officer, the position of several stations are fixed

accurate coast-lining the whole of the been extensively used in govern-work is done on shore, except for the ment surveys in Canada. As an alternative to plane-tabling it may be of advantage in mountainous regions, but Wilson, geographer to the U.S.A. Geological Survey, has pronounced a very unfavourable opinion of it. For most of the illustrations we are indebted to Messrs. Crosby

Lockwood for kind permission to reproduce from G. W. Usill's book. See G. W. Usill, Practical Survey-ing, 1908; J. Whitelaw, Surveying as Practised by Civil Engineers and Surveyors: Major - General Sir C. Warren, Trigonometrical Surveying: N. Kennedy, Surveying with the Tacheometer; J. F. Heather, Sur-veying and Astronomical Instruments; Stanley, Surveying and Levelling Instruments; Bourns, Principles and Surveying; Practice of Yolland. Account of the Measuring of the Lough Foyle Base; Frome, Outline of the Methods of Conducting a Trigonometrical Survey; E. Deville, Photographic Surveying, 1895; H. M. Wilson, Topographic Surveying, 1900; Professor J. B. Johnson, Theory and Practice of Surveying, 1900; Rev. O. Fisher, Physics of the Earth's Crust; Colonel Clarke, Geodesy; Survey of India, Text-book of Tropical Surveying; Ordnance Survey Department, Manual of Map Reading and Field Sketching; Close, Text-book of Tropicarphical Surveying; Royal Geographical Surveying; Royal Geographical Society, Hints to Travellers. Surveyors' Institution, a society incorporated by royal charter to secure the advancement and facilitate the Lough Foyle Base; Frome, Outline of

the advancement and facilitate the acquisition of that knowledge which constitutes the profession of a sur-Its members number over veyor. 5000.

Surya, in Hindu mythology, the sun. He is represented as the son of Dyaus and the husband of Ushas the Dawn, and he moves in a car drawn by fleet ruddy horses. He is the preserver of all things stationary and moving, the source of life, and beholds the good and bad deeds of mortals.

Suryasiddhanta, a famous astro-nomical work in Sanskrit, said to be a direct revelation from the sun. It is sometimes identified with the Saurasiddhanta, one of the five Saurasiddhanta, one of the five earlier works on which the Panchasiddhantika was founded, a work by Varahamihira, who flourished about the beginning of the 6th century.

Sus: 1. A maritime tn. of Tunis, on the Gulf of Hammamet. It is the port of Kairwan, from which it by trigonometrical survey, and the sidstant about 30 m. Pop. 25,000. sights usually taken on the plane table are photographed, and plotting from these is performed in the office later. The process of plotting is very complex; the method has, however, river. Its port is Agadir, the scene

Pop. 200,000.
Susa: 1. Or Shushan, an ancient city of Persia, on the E. bank of the Choaspes, now in ruins, believed to have been founded by Darius. It is mentioned in the O.T. (Daniel), and on its site numerous inscribed stones have been discovered. 2. A fortified tn. of Italy, in Piedmont, 30 m. W.N.W. of Turin. It has a strong citadel and a triumphal arch erected in honour of Augustus. There is also a cathedral dating from the 11th There is century. Pop. 5000.

Susannah, History of, known also as Susannah and the Elders or The Judgment of Daniel, a book of the Apo-crypha belonging to the group of additions to the Book of Daniel. tells how Susannah, wife of Joakim, a chaste Jewish matron, is solicited to sin by two elders, and on her refusal is wrongfully accused by them. Daniel, by his skilful questioning, proves the falsity of the accusation and Susannah is saved. Scholars are generally agreed that the work had no

Hebrew original.

Susiana, see KHUZISTAN.
Suso (or Seuse), Heinrich (1300-66),
a German mystic, born in Constance. He took the name of his mother (his father's name was V. Berg), and studied theology in Cologne and then lived an austere life for some forty years in the monasteries at Constance, Swabia, and Ulm (1848); at the last place he passed the remainder of his life. But S. is chiefly remembered for his holts some of which bered for his books, some of which Büchlein der ewigen Weisheit, Lebensbeschreibring; Buch von den neum Felsen. See Von Görres's edi-tion of his works (Munich), 1906. Suspension Bridges, see BREGE.

Susquehanna, a riv. of Pennsylvania, U.S.A., the main branch of which rises in Otsego Lake, and has a length of 250 m. The other branch rises in the Alleghany Mts., and after a circuitous course of 200 m. joins the main or eastern branch at Northumberland. The united stream flows S. and S.E. past Harrisburg and Columbia, and enters Chesapeake Bay. It is wide and shallow, and much used for floating timber, but of little use for navigation, although canals have been constructed for this purpose.

Sussex, a maritime co. on the S. coast of England, fronting the English Channel, and bounded N. by Surrey, E. by Kent, and W. by Hants. It is RAP, LAST of the from E. to W., and about 28 m. in its broadest part. Area 1466 Soctland, sq. m. Pop. (1911) 666,876. Its Altantic, coast-line is unbroken by bays of any extent, but the promontory of marty.

of European friction in 1911, owing Beachy Head, the termination of to its being occupied by the Germans. the S. Downs (Linchball, 818 ft.), juts out into the Channel. S. is noted Juts out into the Channel. S. Is noted for the number of its fashlonable watering places on its coast, the principal being Brighton, Hastings, Eastbourne, Worthing, Shorcham, Littlehampton, Bognor, Bexhill, St. Leonards, and Seaford. The middle of the county is occupied by the Weald which was formest a forest Weald, which was formerly a forest, now an undulating and fertile tract. on the Downs, which cross the county from W. to E., vast flocks of sheep and cattle are grazed, the Southdown breed of sheep being famous. The county is watered by the Ouse, Arun, Rother, and the Adur. Large numbers of horses are reared, and poultry farming is an important industry. The crops consist chiefly of wheat, oats, and turnips, and fruit is extensively cultivated. Fishing is engaged in all closes the centre. The county returns along the coast. six members to the House of Com-The antiquities of S. mons. numerous and include the castles of numerous and include the castles of Hastings, Arundel, Lewes, Bramber, Hurstmonceaux, Pevensey, Bodiam, etc., the abbeys of Battle, Bayham, etc.; Chichester Cathedral, which was founded in the 11th century, and several Roman encampments. The chief historical events are the landing of the S. Saxons (in 447), the battle of Hastings or Senlac (1066), the battle of Lewes (1264), while the county was also the scene of the county was also the scene of the exploits of Jack Cade in 1450. Sec

M. A. Lower, History of Sussex, 1870, and A. J. Hare, Sussex, 1894.
Sussex, Augustus Frederick, Duke of (1773-1843), the sixth son of George III. The rather eccentric character of this prince of the prince of the surface. of this prince and his marriage to Lady Augusta Murray against the wishes of the court served to estrange him from the king. His marriage was declared void in accordance with the Royal Marriage Act of 1772. spite of the romantic nature of this marriage, the duke deserted his wife and compelled her to sue for alimony. He was made Duke of Sussex in 1801. He was president of the Royal Society

for some years, and he collected a fine library at Kensington Palace.
Susten Pass, a pass in the Alps, Switzerland, which connects the Hasli Valley in the eastern part of the centen of Barn with the valles of the centen of Barn with the valles of the centen of the centen of Barn with the valles of the centen of Barn with the valles of the centen of Barn with the valles of the centen of the c canton of Bern with the valley of the Reuss, canton of Uri.

SustentationFund, see FREE CHURCH. Susterman, Lamprecht, see Lom-

BARD, LAMBERT.

Sutherland, a maritime co. of N. Scotland, bounded on the N. by the Atlantic, W. by the Minch, E. by Caithness, and S. by Ross and Cromarty. It forms a rough square

about 52 m. long by 59 m. broad, with an area of 2028 sq. m., and a pop. (1911) of 20,180. The surface is mountainous in the N. and W., the mountainous in the N. and W., the chief summits being Benmore Assynt (3274 ft.) Conivehall (3234 ft.), Bendibrick (3154 ft.), with several others approaching 3000 ft. In the E. the chief heights are the Hill of Ord (1320 ft.), and Cnoc an Eireannaich (1698 ft.). The S. and S.E. of the co. is fairly level. The coast is rocky and deeply cleft by sea lochs, with bold headlands, such as Cape Wrath and Strathy Point on the N. coast. The most important inland lochs are those of Shin and Assynt, but there are over 300 smaller ones. The interior of the co. is covered with so-called 'deer forests'; they are merely trackless wastes, destitute of trees or mountain moorland, abounding with roe deer. The most fertile. as well as the most populous district is in the valley of Dornoch Firth, where the land is highly cultivated. Dornoch is the county town. There are no manufactures, and the only industry of importance is that of fishing, salmon and herring being the chief catches. The county returns one member to the House of Commons. S. was overrun by the Scandinavians at the beginning of the 11th century, who continued their depredations in the 12th century. During 1810-20 the first Duke of S. drove the poor crofters, who occupied the interior of the who occupied the interior of the county, and were eking out a precarious existence, to the coasts and valleys, causing them to endure terible hardships on the inhospitable land. This act was called the 'S. clearances.' Dunrobin Castle, near Golspie, is the residence of the duke. Sutlej, an important riv. of India, mainty in the Punish rises in W.

mainly in the Punjab, rises in W. Tibet, near Lake Manasarowa at an altitude of 15,000 ft. above sea-level. It flows through the Punjab from E. to S.W., receiving in its course the waters of the Chenab and the Bear, until it reaches the Indus near Mithankot, on the N.W. frontier of Rajputana. Length 900 m.

Sutlej, a British armoured cruiser of 12,000 tons, built at Clydebank and launched in 1899. It has a speed of about 22 knots.

Sutra, in Sanskrit a rule, or a book of rules, which form the basis of teaching, not only in religious ritual but also in philosophy and grammar.

Suttee, sec SATI.

Sutri, a tn. in the prov. of Rome, Italy, on the Puzzola, 25 m. N.W. of Rome. It is a walled town, pierced with many gates, containing many antiquities, including a fine amphitheatre and a rock-hewn church. Pop. 2800.

Sutton, a small tn, and urban dist. of Surrey, England, 4 m. W. of Croydon. The High Street is a picturesque part of the main road to Reigate, where it ascends the downs. It is becoming a residential district. Pop. (1911) 21,275.
Sutton, Thomas (1532-1611), founder

of the Charterhouse, London, a shrewd man of business, amassed a great fortune, and was supposed to be the richest man in England in his day. He spent much money on philan-thropic enterprises, and is best known for having founded and endowed a school and hospital at the Charterhouse, the hospital being for gentlemen who have fallen upon evil days. The school has been removed to Godalming, but the hospital remains on the old site in the heart of the City of London.

of London.

Sutton Bridge, an urban dist. and river port of Lincolnshire, England, on the R. Nen, 7 m. N. of Wisbech. It has trade in corn, coal, and timber. Pop. (1911) 2156.

Sutton Coldfield, a market tn. and municipal bor. of Warwickshire, England, 26 m. N.W. by W. of Warwick, and the state of the s

and practically a residential suburb of Birmingham. Farming is the chief occupation outside the town, while the manuf. of hardware constitutes

the principal employment of the inhabitants. Pop. (1911) 20,132. Sutton-in-Ashfield, an urban dist. manufacturing and market tn. of Nottinghamshire, England, 14 m. from Nottingham. It has manufactures of cotton, hosiery, and thread, and its church of St. Mary Magdalene dates from the 12th century. Pop.

(1911) 21,707.

Sutton-on-Sea, a watering-place of Lincolnshire, England, 3 m. from

Mablethorpe.

Suture (sutura, a seam), a term applied (1) to a form of articulation met with only in the skull, where union is accomplished by fibrous tissue continuous with the periosteum; (2) to a stitch or stitches closing the contiguous margins of a wound. Cranial Ss. are divided into true and false. The former, known as sutura vera, are those the articulating surfaces of which are connected by a series of projections and notches dovetailed of projections and notenes deverance together. The margins of the bones are not in direct contact, however, but are separated by a membrane which is a continuation, externally of the perieranium and internally of the dura False Ss. are those formed mater. when roughened surfaces are placed in apposition with one another. True and false Ss. are further subdivided. The true are of three kinds, namely, sudura dentata, serrata, and limbosa. There are two varieties of false, which

are known as sutura squamosa and and captured Ismail. In 1792, when harmonia. There is a great variety of peace was made between Russia and gether the lips of a wound.

Suwalki, a tn. of Russian Poland,

Suwalki, a tn. of Russian Poland, on the Hancza, 54 m. N.W. of Grodno. It is the cap. of the gov. of Suwalki, and has trade in woollen cloth, timber, and grain. Pop. 27,500. Suwanee, a riv. of U.S.A., which rises in Georgia, flows S., and then enters the Gulf of Mexico. It is navigable as far as White Springs. It is the 'Swance River' mentioned in the well-known song called 'Old in the well-known song called 'Old Folks at Home.' Length 240 m.

Suwarrow, or Suvorov-Rymnikski, Alexander Vassilyevich, Count, Prince Italinski (1729-1800), a Russian soldier, born in Finland. He obtained a lieutenancy in a regiment of the line, was raised to the rank of first-lieutenantthree years afterwards, and in 1758, when the war with Prussia broke out, he was entrusted with the command of the garrison of Memel. In 1759 he was present at the battle of Kunnersdorf. Cathe-rine II., in 1763, named him colonel of the Astrakhan regiment of infan-Five years afterwards he was commanding officer of a part of the Russian troops which were engaged in warfare with the confederation of was made major-general, and in 1773, he was sent against the Turks under Field-marshal Rumyanstow. victories by Suvorov over the troops of Mustapha III. prepared for the complete defeat of the Turks, and complete deteat of the Turks, and having effected a junction with the army of General Kamenskoy, a fourth victory, June 1774, put an end to the contest. In the meantime Pugacheff, a Cossack of the Don, who pretended that he was Peter III., had assembled a numerous army. A formidable insurrection army. A formidable insurrection threatened to overthrow the throne of Catherine; the negotiations with the Ottoman Porte had scarcely terminated when Suvórov was ordered to meet the insurgents. He settled the troubles, and soon re-He stored perfect tranquillity to the empire. In 1783 he subjugated the Cuban Tartars and those of Budziac, and was raised to the chief command which he held throughout the second Turkish War which broke out in 1787.

Ss. which are used in bringing to- the Porte at Yassy in Moldavia the EmpressCatherineappointed Suvorov Suva, the cap. of the Fiji Is., in the island of Viti Leon. Pop. (1911) 7788. Suvalik Hills, a range of the United Provinces, direction is parallel with the United Provinces, direction is parallel with the United Provinces.

Himalayas, and they stretch from against them. He gained several remains of large animals are found storming of Pragal which was taken here. after a desperate fight of four hours, and which opened to him the gates of Warsaw, Nov. 9, reduced the Poles to obedience. On this occasion Catherine made him a field-marshal. In 1799, after the death of Catherine, the Emperor Paul gave him the command of the troops which fought in Italy against the French. Some reverses caused by the behaviour of the Austrian army, roused the indignation of Paul, and he recalled his forces. Suvorov learnt in Riga that he was in disgrace; nevertally and the cartinud his increase. theless he continued his journey to St. Petersburg, and in sixteen days after his arrival Suvorov died.

Suwo-Nada, or the Inland Sea of Japan, separates the S.W. extremity of the island of Hondo from the N.E.

of the island of Kiushin.

Suydal, a tn. of Russia, in the gov. of Vladimir, 23 m. N. of Vladimir. An old town, it contains various churches and monasteries of the 13th century. The chief industries are market gardening and those connected with the manufacture of cotton. Pop. 8500.

Suzerain, a term of feudal law, now used to describe the vague relations Bary in Poland. On his return he which exist between powerful and

dependent states.

Svastika, sec Swastika.

Sveåborg, a fortress of Finland, adjoining Helsingfors. It was constructed in 1749 and betrayed to the Russians in 1808. It suffered bombardment at the hands of the Anglo-French in 1855.

Syendhorg, a thriving scaport of Denmark on the island of Funan, 23 m. S.S.E. of Odeuse. It has one of the best harbours on the island, and is an emporium for the produce of the adjacent islands. There are textile factories, breweries, tilleries, and foundries, and it exports agricultural produce. Pop. 12,667. Sverdrup, Jakob (1846-199), a Nor-wegian politician, was the nephew of

Johann S., over whom he exerted a great influence. He was a member of the Radical cabinet of 1884, and represented the Moderates in the Hagerup ministry, 1895. He became Bishop of Bergen in 1897.

Sverre (1151-1202), King of Nor-In 1789 S. won the battle of Fokshany way, was a native of the Farce Is. He was proclaimed king in 1177, nest, somewhat like a flattened cup. having been adopted as leader by the He was a military Birkebeiner. genius, and having defeated and slain Magnus at Nordes (1184), built up a powerful monarchy with the aid of the landowners. But he had as his enemy the Church, and in 1198 the whole land was laid under an interdict. His last years were harassed by the rise of the Baglers or 'crozier-

Swabia, a name now confined to a Bavarian province, 3792 sq. m. in area, with its capital at Augsburg. Pop. (1910) 789,853. It was originally used to denote a province of Germany which existed in the middle

Swadlincote, a tn. of Derbyshire, England, 15 m. from Derby. It has

manufactures of earthenware and fireclay goods. Pop. (1911) 18,676.
Swaffham, a market tn. of Norfolk, England, 15 m. from King's Lynn. It has a fine church with a carved roof of wood and possesses iron foundries, besides a considerable agricultural trade. It is also noted for its cattle and sheep fairs. Pop. (1911) 3234.

Swaheli, or Suahili, a people in-

swanen, or suanin, a people inhabiting the coastal region of E. Central Africa, German E. Africa, and British E. Africa, between Mombasa and Zanzibar. They are of Bantu origin, but have mingled freely with the Arabs, who have greatly influenced their customs, language, and religion. All profess Mohammedanis used for is used for

the various

whom the S. are constantly in touch, either as caravan leaders, traders, or expeditionary guides and porters. See Krapt's Dictionary of the Suahili Language, 1882; Steere's Handbook of the Swaheli Language, and his collections of the State of Feb. Malaga, 1880, and Malagae. tion of Folk-Tales, 1869; and Madan's

English-Swahili Dictionary, 1894.
Swale, a riv. of Yorkshire, England, which rises in the mountains on the border of Westmorland, and flows E.

and S.E. to the Ure, which it joins to form the Ouse. It has a length of 60 m.

Swallow (Hirundo rustica), the well-known passerine bird, which is widely distributed throughout Europe during the summer, but winters in Africa and tropical Asia. It begins to arrive from the end of March, but in the course of its migration it is ruth-lessly destroyed in Southern Europe for its plumage, and its numbers appear to be gradually diminishing. Its back and wings are blue-black; the throat and forehead, chestnut; and the breast, pale buff or pinkish. Its two outside tail feathers are elongated into a graceful fork, which is more pronounced in the male.

is made of mud, straw, hair, and feathers, and is usually built attached to the rafters of barns. Ss. feed entirely on winged insects, capturing them in the open mouth, which is lined with bristles made viscid by a salivary secretion. It is, therefore, of great economic value, and the in-creasing prevalence of gnats and other insects may often be traced to the disappearance of this bird. Other species include the red-rumped S. (H.

rufula) of the eastern Mediterranean. Swallowing, or Deglutition, the act by which food leaves the mouth cavity for the gullet. The contraction of the tongue muscles pushes the food from the top of the tongue backwards to the fauces. The soft palate is then raised by reflex action to prevent the food proceeding to the nasal cavity, and the glottis closes to prevent it entering the larynx. The constrictor muscles of the pharynx then urge the food into the gullet, where it is impelled towards the stomach by peristaltic action.

Swallow-wort, a name applied to many species of Asclepias (q.v.), with reference to the resemblance of the

seeds to a swallow in flight.
Swammerdam, John (1637-80), a celebrated natural philosopher. He went to the University of Leyden in 1651, and in 1653 was admitted a candidate of physic in that university. In 1663 he published a General History of Insects, and in 1675 his History of the Ephemeras. His works were translated by Gaubius from the original Dutch into Latin, from which they were translated into English and published in 1758.

Swampscott, a tn. of Essex co., Massachusetts, U.S.A., noted as a fashionable watering-place. Pop.

(1910) 6204.

Swan (Cygnus), a genus of birds with elongated body and neck and short feet. The base of the bill is short feet. The base of the bill is fleshy and naked, and the sexes are similar in plumage. About eight species are known, of which four have been known to visit Britain in the wild state. The mute S. (C. olor) is the semi-domesticated bird of rivers and ornamental waters. It has the front part of the bill orange. young are greyish-brown, while those of the smaller Polish S., a sub-species. are white. The whooper or whistling S. (C. musicus) has no knob at the base of the bill, the tip of which is black; it differs also in the carriage of its head and neck. The plumage is pure white with dull black legs and feet. Bewick's S. (C. bewicki) is the smallest British S., and frequently visits Britain in the winter. The bill Its is black and the deep yellow of the

basal portion does not extend below the nostrils. The trumpeter S. (C. bucci notora) is a N. American bird of great size. The bill and feet are entirely black. Another N. American species is the common American S. (C. columbianus) which neually has a of stray bats. Pon. (1911) 4689 (C. columbianus), which usually has a yellow patch in front of the eye; it is yenow patch in hone of the eye; 10 is slightly smaller than the trumpeter. Other species are the black-necked S. (C. nigricollis) of S. America and the black S. (C. atratus) of Australia.

black S. (C. atralus) of Australia.
Swan, Annie S. (Mrs. Burnett
Smith) (b: 1860), a novelist, born at
Gorebridge, near Edinburgh. She
began her literary career by writing
for the local papers, but afterwards
wrote books for children, and finally
took up novel writing, publishing her
first, Aldersyde, in 1883. Other
novels are: Gates of Eden, A Lost
Ideal, A Victory Won, Who Shall
Serve, A Divided House, The Curse of
Cowden. Mrs. Keith Hamillon, M.B., Couden, Mrs. Keith Hamilton, M.B., The Ne'er-do-Weel, Not Yet, Burden Bearers, and An Only Son. She is also interested in the Woman at Home, and has contributed largely to it.

Swan, John Macallan (1847-1910), a painter and sculptor, horn at Old Brentford. He studied at the Royal Academy as well as in Paris, and began to exhibit in 1878, devoting himself at first to painting, but aftermmsen at miss to painting, out after-wards taking up sculpture as well.
Among his pictures are 'The Prodigal'
Son,' Maternity' (a lioness sucklingher cubs), and 'Leopards'; and
among his works in sculpture are:
'The Walking Leopard,' Orpheus,'
'Indian Leopard and Tortoise,' and
the eight colossal lions for Rhodes's
reconverse, at Grote Schaur, Caremonument at Groote Schaur, Capetown. He was elected a member of the Royal Academy in 1905. He wrote a Treatise on Metal Work.

Swan, Joseph (1791-1874), an Eng-

lish anatomist, was surgeon to the Lincoln County Hospital, 1814-27. He did much for the science of anatomy, excelling especially as a dissectionist. He became F.R.C.S. in 1843. His chief work was A Demonstration of the Nerves of the Human Body, 1830.

Swan, Sir Joseph Wilson (b. 1828), an inventor, knighted in 1904. Sir Joseph was born at Sunderland and educated locally. He made his name by his inventions, many of which are in constant use as familiar processes of modern life. The carbon process of printing in photography is due to him, the development of the 'rapid' plate in the same science, and many improvements in the processes of electro reproduction. He is best known, however, for the incandes-

ing-place on the Isle of Purbeck, Dorsetshire, England. There are stone quarries and the manufacture of straw hats. Pop. (1911) 4689.

Swanee River, see SUWANEE. Swanevelt, Hermann (c. 1620-90), a Dutch landscape painter and engraver, born at Woerden. He travelled in Italy, studying the scenery, etc., but ultimately met Claude Lorraine, with whose help he became one of the leading landscape painters of his day. He also executed a number of etchings, said by some to have been better than his pictures.

Swan River, a riv. of Western Australia, which rises under the name of the Avon, and after flowing N. and W. enters the Indian Ocean. Perth, the cap. of W. Australia, stands on

its banks. Swansea, a market tn., scaport, and parl., co., and municipal bor. of Glamorganshire, S. Wales, at the mouth of the R. Tawe. It is the chief seat of the copper trade, although copper smelting, which during most of the 19th century was the chief in-dustry, has not maintained its relative importance, and produces three-quarters of the tinplates and nineteentwentieths of the spelter or zinc manufactured in the kingdom. Beworks in England, and manufactures gold, silver, steel, iron, nickel, cobalt, yellow metal, sulphurio and hydrochloric acids, creosote, alkali, patent fuel, bricks, and flour. The harbour and docks are extensive and these is and docks are extensive, and there is an active trade in coal and patent fuel with the chief British ports and those of the continent, although this was much hindered in 1911 by the strikes. The eastle, whose tower is a picturesque feature of S., is said to have been originally built about 1120, have been originally built upon the but was rebuilt about 1330. The but was rebuilt about 1330. The but was rebuilt about 1330. Wales, Bourt was repulit about 1330. The Royal Institution of S. Wales, founded in 1835, has a handsome building in the Ionic style, and contains a museum, a library with the original contract of affiance between Edward II, and Isabella, and an art gallery. The grammar school was founded in 1682 by Hugh Gore. S. was chartered by John and incorporated by Horny III. Pag. (1611) porated by Henry III. Pop. (1911) 114,673.

Swansea Bay, a bay in Glamorgan-shire, Wales, which enters from the

Bristol Channel.

Swanwick, Anna (1813-99), an educationist, and a pioneer of the modern feminist movement. By her cent flament electric lamp, which was work in connection with the women's the first successful lamp of its kind. colleges, such as Bedford College and A miner's electric safety lamp is Girton, she did much to further the work in connection with the women's cause of the higher education of peans. The country has fine grazing women. She was one of the first land, and stock-raising is the chief presidents of Bedford College. In occupation of the inhabitants. The addition to her philanthropic and scholastic work she published several books, making translations from the Greek and the German.

Swartz, Professor Olaf (1760-1188), a Swedish botanist, remembered chiefly for his Flora India Occidentalis, After him was named the leguminous genus Swartzia, which includes a number of tropical Ameri-

can shrubs and timber trees. Swastika, also called Fylfot, curious religious symbol or talisman, believed to have originated in India or China and introduced into Europe in the 6th century. In form the S. is a Greek cross, the arms of which are like elbow-joints, all bent at right angles. Sometimes the figure is comprised in a circle, the circumference of which is described through the extremities of the arms. In the East



the S. was used as a mystic symbol by the Buddhists, and apparently it is still so used at the present day by the Buddhists and Jains of India and China, Japan, and among the Indian tribes of America. In Europe in the middle ages the S. often figures in decoration and embroidery. Instances are to be seen in the em-broidery on the mitre of Thomas à Becket, and again on the brass in

Lewknor Church, Oxon.
Swatow, a treaty port of China in the prov. of Kwangtung, on the E. coast at the mouth of the R. Han. The manufacture of sugar is the chief industry, the surrounding country being a great sugar-cane district, and next in importance is the manufacture of bean-cake. It has a considerable foreign trade (opened in 1869) chiefly with Great Britain, and exports tea, grass-cloth, pine-apple cloth, oranges, fans, pewter, and iron and tin wares. A railway 200 m. in length is under construction to connect S. with Canton. Pop. (1910) 96,000.

agricultural products consist maize, tobacco, beans, sweet potatoes, pumpkins, and ground nuts. Its mineral resources are as yet unde-veloped, but gold and tin are mined veloped, but goid and out are minuted to a small extent. Cotton plantations are being established. A police force was created in 1907, composed of about 200 men. There are four government schools for Europeans, and one native school at Zombode. In 1910-11 the revenue amounted to £58,723 £62,258. and the expenditure

Swearing, in its various forms. irsing, blasphemy, profane and cursing, obscene language, is an offence which is either dealt with summarily under Acts mentioned below, or, in the case of blasphemy, by indictment. S. was for long a matter for the ecclesiastical courts administering the canon law and remained outside the province of the common law altogether. By an the common law anogemer. By an Act of 1624, 'profane cursing and swearing' were visited with the stocks or a fine of 1s. Later, by the Profane Oaths Act, 1745, S. having apparently become extraordinarily general, a scale of charges varying with the social status of the offender was imposed; the curse or oath of a labourer, common soldier, or seaman cost him 1s.; of any other person under the degree of a gentleman, 2s.; of any person of or above the degree of a gentleman, 5s. A string of oaths would, however, be regarded as a single complete offence. It seems that single complete olience. It seems that the Act does not apply to women (Stone's Justice of the Peace), though no doubt a conviction for disorderly conduct would follow. The penalty is recovered by information on oath of any person, and the charge must be proved within eight days next after the offence. Default in averafter the offence. Default in payment is followed by imprisonment with hard labour, as regulated by the scale of punishments in the Summary Jurisdiction Act, 1879, but the term must not exceed ten days. penalties are applied to the relief of the poor of the parish. The Act is still in force, but is not often made use of, because convictions can be obtained against most local offenders under either: (1) The Town Police Clauses Act, 1847, which punishes profane or obscene language in the streets if uttered to the annoyance Swaziland, a native state of S. of residents or passengers with a fine Africa, lying in the S.E. corner of the Transvaal, administered by the High Commissioner for S. Africa. It has an area of 6536 sq. m. and a pop. of 99,959, of whom 98,733 are natives of Laws made under the Local Government and the state of the st Zulu type, the remainder being Euro- ment Act, 1888, and the Municipal

of municipal corporations. As to blasphemy see under that title.

Sweating Sickness, or English Sweat, an epidemic sickness, which suddenly appeared in England in 1485, a few weeks after Henry VII. ascended the throne. The disease attacked persons of high social position even more numerously than the poorer classes. It commenced with a chill and giddiness, followed by febrile symptoms, and pains in the neck and limbs. The patient was tormented with thirst and drenched with an inexhaustible sweat. He either recovered or died within twenty-four hours. disease disappeared again in a few weeks, reappeared in 1508, 1517, 1528, and 1551, since when no epidemic exactly answering the description has been recorded.

Sweden: The country is on the whole agricultural, and live stock are reared in many parts. This is an industry for which much of the country is very suitably adapted. The provinces which yield the greatest in-crease are Scania and Halland, and here much progress has been made during recent years. The wealth of forest lands and the excellence of the timber grown has done much to promote an industry which is increasing rapidly every year, and which has a great export trade with Great Britain. The export of timber is the greatest industry, as far as trade returns are concerned, which the country at present has. On the whole the general observation may be made that within recent years the Swedes have made great progress. The excellence of their trade and technical schools has helped much in this matter, whilst they have also used to a great extent the water power of the large number of rivers. The mineral large number of rivers. The mineral wealth of the country is enormous, the iron mining industry being the Huge greatest and most important. deposits of iron are to be found in Lappland, zine is found at Ammeberg, copper is mined at Falun, and silver at Sala. Coal is found in silver at Sala. Coal is found in scarcely noticeable quantities, and what little there is is found principally in Scania. The iron of the country, however, is famous for its purity as well as for the quantities in which it is found. The trade and commerce of the country is helped much by the excellence of the means of communication. The roads are of communication. The roads are good and are to be found in all parts of the country. The efficacy of the natural waterways is much im-

proved by the canals which have been

built to complement them, and in this

Corporations Act, 1882, framed for the whole of the open season. The the punishment of S. in the districts railway system has recently been greatly improved, and S. can now boast a greater mileage of railways per boast a greater inneage of ranways per head of population than any other country in Europe. Naturally in the loundands of the south, communica-tions, especially railway communica-tion, are better than in the N., but even there the railway communication can be described as efficient. The tele-graphic and telephonic systems have received much attention and are in a very highly developed state. Speaking generally, as regards education, we may say that the Swede is very well educated. Attendance at school is compulsory, and almost all the inhabitants can read and write. educational system has within recent years received much attention and is at present highly developed. The army is good and well trained, and the navy has been but recently improved and increased. On the whole we may say that S. has shown remarkable progress during recent years. The average population of S. per square mile is about 31'8 Area 172,876 sq. m. persons. 5,521,943,

DIVISIONS AND TOWNS,-The three chief divisions of S. are Svealand, Götaland, and Norrland. The two historical former represent an old division which, in turn, represents a

difference of race and tradition, and which was divided by the great forest lands of S.

Svealand may be regarded as the essential part of S., the mother province. Here at the outlet of the Mälar Lake is to be found the capital, Stockholm, one of the finest cities of Europe. The modern town for exceeds Europe. The modern town far exceeds the limits of the ancient one, but here are to be found at the present time the old palaces and the old burying places of the royal house, fine schools places of the royal house, line schools and colleges, and many magnificent buildings. The town itself is the centre of the chief industries of S. and has a huge import trade, though its export trade is exceeded by the towns of Göteborg and Malinö. The town is well defended and well fortified. In the immediate neighbourhood is found the form of Unselfbourhood is found the town of Upsala, which contains an historic cathedral and the oldest of all the Swedish universities, founded in 1477. The town of Falun, also in this district, is

notable for its copper mines.

Norrland has numerous towns. most of which are at the present time increasing in value and prosperity. They are found chiefly on the coast, and amongst them may be mentioned Gefle and Sundswall. The interior has not many towns and certainly none of note. A railway connects up the way communication is kept up during | note.

Götaland contains the most fertile districts and includes Scania. The greatest of all its towns is Gothen-burg or Göteborg, which has the largest export trade of all the towns of S. In appearance and picturesqueness it is, however, inferior to Stockholm. Other towns of importance are Hel-singfors and Malino. The town of Lund, which stands inland, is of in-terest since it contains S.'s second university, founded in the year 1668. This district also contains the town This district also contains the town of Norrkoping, which may be regarded as the greatest industrial centre of S. Standing on the island of Gothland is the old town of Visby, which during the days of the old Hanseatic League was of vast importance, but now owes its chief interest to the fact that the ruins of its old church and its really recease reset. old church and its walls prove a great attraction to the visitor. On the whole, practically one-fifth of the entire population of S. live in the towns. The remainder live on farms

principally, but in the south many villages are to be found. HISTORY.—The early history of S. is, of course, closely wrapped up in legend and saga. The country appears to have been inhabited by two separate races which were, however, very closely related, the Syer and the Goter, names which can, of course, be traced in many place-names at the present time. The old mythology of present time. The old mythology of the North, or worse, remained the re-ligion of the people until well into the 12th century, although Chris-tianity was introduced at a very much earlier period. It failed, how-ever, to assimilate the whole of the country until very much later. During the 14th century Epilond was During the 14th century Finland was added to the territories of S., but the ruling dynasty of S. was so weak that the nobility and clergy were able to extort privilege after privilege, which left the monarchy in an exceedingly weakened state. Finally, in 1397, they united themselves with Norway and Denmark by imploring the aid of Margaret of Denmark, who by the union of Kalmar united the three kingdoms. But the union was far from being successful. It certainly succeeded in its immediate aim, but later monarchs became irksome to the Swedes. They had no sympathy with a monarch, German in race and ideas, who would do little for their national aspirations. They formed national aspirations. They formed national parties, they conspired, they rebelled, but it was not until the beginning of the 16th century that the real revolt came. Christian II. of

mines of the Gellivara district with a scion of the Vasa family, who, in the town of Lulea. 1523, after a two years' rebellion, was acclaimed and elected by the Riksdag Gustavus I. of S. But S. did not regain her freedom right away. Denmark still held possessions in the southern mainland and the island of Gothland. Gustavus I.'s reign was the scene of the struggle between the old faith and Protestantism. By 1529 Protestantism had been adopted as the state faith, but merely, or rather, to a great extent from a political as much as from a religious point of view. But the faith was even yet by no means definitely established. By the end of his reign Gustavus had been instrumental in establishing some stability and some financial soundness in the country, but his work was hardly continued by his sons, Eric XIV. (1560-68) and John III. (1568-92), both of whom rather inclined towards Catholicism and did little by their foreign wars, chiefly with Denmark foreign wars, chieffy with Denmark and Russia, to strengthen their country. Sigismund, elected King of Poland, 1587, was a pronounced Roman Catholic, and was in 1599 forced to leave the country by his uncle, Charles IX., who succeeded him. He was a staunch Protestant, and by the Synod of Upsala strengthened the hands of the Restrengthened the hands of the Re-formation very considerably in S. He aimed at a great Protestant league, of which he should be the leader, but he died before he had accomplished this, leaving the throne to Gustavus Adolphus, the Protestant champion of Europe, during the middle stages of the Thirty Years' War (q.v.). S. made great strides under Gustavus Adolphus. A war with Denmark was the least successful of her affairs, but was brought to a close by Gustavus Adolphus. War with Russia gave S. control of what is now the Baltic coast of Russia, whilst war with Poland ended in a truce which gave S. a grip on the mainland of Germany of the poland his extention. many. He next turned his attention to the Thirty Years' War and appeared as the Protestant champion of Europe. Between 1629-31, he carried all before him; the Catholic League was defeated, the Catholic general, Tilly, outmanouvred and finally Tilly, outmanceuvred and finally killed, and Gustavus Adolphus was able to penetrate to the south. He was recalled by the attacks of Wallen-stein in Saxony, and fell at the victory of Lutzen in 1632. He was the real founder of the greatness of S. He made her a strong power by his internal and financial reforms, and he beginning of the 16th century that won for her a great place in the the real revolt came. Christian II. of councils of Europe. The government Denmark aimed at the extirpation of the Swedish nobility; S. rebelled under was reformed, and S. for the next

Oxenstjerna, a true political successor of Gustavus Adolphus. The success of S. was seen at the Treaty of Westphalla. She became the controlling power of Germany, the Protestant champion of Europe, and the greatest power of the N. Denmark, gratuit-ously seeking trouble in 1644, was by the treaty which followed in the next year stripped of much that she had previously possessed. In 1654 the crown was handed over by Christina to her cousin, Charles X. He con-He continued the work of Gustavus Adoltinued the work of Gustavus Adolphus. His great ambition was to make the Baltic a Swedish lake. He attacked Denmark and gained some territory, and in 1660, the year of his death, by a treaty with Poland he added still more to the German territories of S. Charles XI., who succeeded, was only four years of age, and his long minority saw the wasting of the resources of S. by an effete nobility. A useless war was fought against Denmark and Brandenburg, and dragged on until Charles himself was able to take part Charles himself was able to take part in it. By his exertions he was able to preserve intact the territories of S., and then turned his attention to in-He crushed the ternal reform. nobility judiciously but on occasion cruelly. He instituted many reforms; he gained on the whole the support of his people, and left S. reformed and restored at his death in 1697. Charles XII., the wonder of Europe, succeeded. He spent the twenty succeeded. years of his reign in almost constant warfare, but a warfare forced on him by the combination of his enemies. Charles did his best, astonished Europe by his enterprise and dash, but was really badly beaten, and his death probably alone saved S. from utter disaster. During the next fifty years, under the rule of Urica Leonora (d. 1720) and Frederick (d. 1751), much of her territories were ceded to Hanover, Prussia, and Russia. She had now fallen from her high estate and can no longer be regarded as a first-class power. The warfare, but a warfare forced on him regarded as a first-class power. The 18th century witnessed in S. a great struggle between rival factions for constitutional monarchy. Hitherto, melse. He was followed by Stephen constitutional monarchy. Hitherto, Columbus (d. 1679) and Peter Lager-S. may be said to have been ruled by a desponsin, sometimes benevoicit, sometimes not. Now she claims a personified in his poetry. The next influence felt in S. was that of the chief power was to be vested in the Rissdag or Parliament. But even this reform was carried to extremes; party quarrels were frequent and a despotism, sometimes benevolent,

century can be really regarded as one of the great powers of Europe. Gustavus Adolphus was succeeded by his daughter Christina, whose minority was made famous by the statecraft of the chancellor, Axel saved. The constitution again because of the constitution again because of the chancellor and the constitution again because of the country quickly became practically anarchic. came monarchical but of the type of a limited monarchy. The power of the purse was expressly reserved to the Riksdag, but otherwise Gustarus ruled as a benevolent despot. Finance and commerce were reformed, and S. seemed again to be about to become a power to be reckoned with. Gustavus also raised the prestige of the nation by his successful wars with Russia and Denmark. He was assassinated in 1792. During the reign of his son, Gustavus IV., pracreign of his son, Gustavus IV., practically all the foreign possessions of the country were lost to Russia and Prussia. In 1809 Gustavus IV. died and was succeeded by his uncle, Charles XIII., who adopted as his heir Charles John (formerly Marshal Bernadotte), who was also elected heir by the Riksdag (1810). In 1815 S. and Norway were united and remained so until the bloodless dissolution in 1905. The crown passed to mained so until the bloodless dissolu-tion in 1905. The crown passed to the family of Bernadotte, in which family it still remains. During the 19th century S. has played but a little part in the politics of Europe. The constitution has been revised and. as has been pointed out, Norway has seceded. LANGUAGE AND LITERATURE.—The

literature of S. is almost entirely modern. The runes which have been preserved since very early days have a great historic and archicological interest, but hardly have any influence on literature. The real beginnings of Swedish literature approximate to that period when S. was beginning to that period when S. was beginning to take a really active and prominent part in the councils of Europe. Edu-cationally, S. had fallen away from her earlier traditions by the time of the Reformation; and inhabitants were perforce compelled to seek for education in the universities of Ger-

lof (d. 1699), a poet whose religion is personified in his poetry. The next influence felt in S. was that of the

largely by English influences, sprang Berattelser is the greatest of these up. The influence of the Restoration historical novels. Neo-Romanticism poets, and later and more especially had as its leaders Nyblom and the influence of Swift and Addison, Snollsky, leaders of a body of men up. The influence of the Restoration was very largely felt, and in this period we have the production of many dramas and much really fine work. The great names of this period are Samuel von Triewald, Carl Gyllenborg, and Modée, together with, perhaps, the greatest of all names, Dalin. Amongst the latter's works may be mentioned: Svenska Argus, where Addison's influence is very largely seen, Aprilverk, and Saga om Hasten. He also was the Saya om Hasten. He also was the first historian of any critical value, as can be seen from his book Srea Rikes Historia. The 18th century witnessed a beginning of the French influence and the vogue of pastoral poetry, which finds such ample expression in Creutz (d. 1785). Gustavus III., himself a playwright of no mean merit, as witness Siri Brahe (1788), not unnaturally gave great impulse literary movements, and his reign may be regarded as the golden age of may be regarded as the golden age of Swedish literature. Amongst the writers of that period who may be mentioned are: Oxenstjerna (d. 1818), author of Skordarne and Disa; Kellgren (d. 1795), influenced largely by Voltaire, editor of the Stockholm Post, and dictator of literary circles during the later part of the 18th century; Leonald gritin and scivils. these writers wrote largely under these writers wrote largely under French influence and looked to France as their model. National literature with national ideals and ideas, however, was exemplified in the writing of Bellman, Lidner, Hallman, and Kexel. Thorild (d. 1808) was separated from both these capacita in feat he formula carbool. schools, in fact he formed a school of his own, and was certainly little appreciated and probably still less flourished as during the ea. . parated itself from the earlier formal literature of that country. Of the Romantic school may be mentioned Askelof and Atterbom, who exemplify this school best. Under the title of the Gothic Union we find banded together

a body of writers, whose object is to extol the greatness of S. and to exalt everything that is Swedish; to this union belonged Esaias Terner, the author of the famous Frilliofs Saga. The mystic Stagnelius stands apart from all these. Of the 19th century Runeberg is one of the finest poets, and romance is to an extent typified by Frederika Bremer and Emilie Flygare Carlén both of whom writer Flygare-Carlén, both of whom wrote excellent romances, whilst almost at the same time we find the beginning

who were critics and poets. Snoilsky's Svenska Bilder is one of the greatest of Swedish poems. The modern realistic school has for its leader Georg Brandt, who has perhaps been responsible for the broadness of thought and realism of description of the writers of that school.

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1886. Swedenborg, Emanuel (1688-1772), the eldest son of Jesper Swedberg, bishop of Skara, in Sweden, born at Stockholm. He was educated at the University of Upsala, and studied the learned languages, mathematics, and natural philosophy. At the age of twenty-two he took his degree of doctor of philosophy, and published the academical dissertation which he the academical dissertation which he had written for the degree on the Mimi of Seneca and P. Syrus, and others. In 1710 Swedberg came to England, and spent some time at Oxford. He lived afterwards for three years chiefly in Utrecht, Paris, and Greifswalde, returning to Sweden in 1714, through Stralsund, just as Charles XII. was commencing the siege of that city. His next productions were a small volume of fables and allegaries in Latin prose. and a and allegories in Latin prose, and a collection of Latin poems. In 1716 Swedberg commenced his Dædalus Swednerg commenced his Dedatus
Hyperboreus, a periodical record of
inventions and experiments by Polhem, the great Swedish engineer, and
others, and of mathematical and
physical discoveries of his own. In 1716 Swedberg was invited by Polhem to repair with him to Lund to meet Charles XII., on which occasion he was admitted to much intercourse with the king, who appointed him assessor in the Royal Metallic College of Sweden, and directed that he should accompany and assist Polhem in con-structing his mechanical works. among which were the locks between Wener Lake and Göteborg. The Dædalus Hyperboreus was completed in 1718, in which year Swedberg the same time we find the beginning transported over mountains and val-of the historical romance. Fallskarene leys, on rolling machines of his own invention, two galleys, five large boats, and a sloop, from Strömstadt at Stockholm, a work On the Deto Iderfjol, a distance of fourteen miles, in order to forward the siege of Frederickshall. Swedberg's next of the Powel Board of Misse and the Currency. literary works were The Art of the of the Royal Board of Mines and his Rules (an introduction and Attempts to find the

places by means of the Moon. III 1/19 the family was ennobled by Queen Ulrica Eleonora under the name of Swedenborg. From this time he took his seat with the nobles of the equestrian order in the triennial assemblies of the states. In this year he pub-ished three works in Swedish: A



EMANUEL SWEDENBORG

Proposal for a Decimal Arrangement of Coinage and Measures, to facilitate Calculation and Suppress Fractions; A Treatise on the Motion and Position of the Earth and Planets; Proofs de-rived from appearances in Sweden, of the Depth of the Sea, and the greater Force of the Tides in the Earliest Ayes. In the spring of 1721 he again went abroad through Denmark to Holland, and published a number of small works at Amsterdam. From Amsterdam he went to Aix-la-Chapelle, Liège, and Cologne, and visited the mines and smelting-works near those pipzig in 1722,

Miscellaneous Objects, par-, and Moun-

tain Strata; and at Hamburg, during the same year, he published a con--ls, Iron, and the professed objec n's Cavern. This his search he ch processed object his search he ch preceded it, and resolved shows a rare power both of accumulating facts and applying principles. to combine and reorganise the

In 1729 he was admitted a

of the Royal Academy of sciences at Upsala. In 1733 he again travelled into Germany. S.'s Opera Philosophica et Mineralia were published in 1734. This large work consists of three distinct treatises. The first volume contains 'Principles of Natural Philosophy, consisting of new attempts to explain the phenomena of the elemental world in a philosophical manner. The second and third volumes are together called the 'Regnum Minerale'; the second is on iron, the third on copper and brass. on iron, the third on copper and bross. In the same year S. published An Introduction to the Philosophy of the Infinite, and the Final Cause of Creation. It established his reputation throughout Europe. Christ. Wolff and other foreign literaticagerly sought his correspondence; and the Academy of Sciences of St. Petersburg appointed him a corresponding member. In 1736 he again travelled. The journal of his tour, from 1736 to 1739, is in MS. in the Academy at Stockholm. At this time he applied himself to anatomy and physiology, of a masterly acquaintance with which he gave evidence in his Economia Regni Animalis. In 1741 he became a fellow of the Royal Academy of Sciences of Stockholm. He still continued earnest in the pursuit of physiology, and in 1744 published the Animal Kingdom, parts i. and ii., at the Hague, and in 1745 part iii. in London. At the beginning of 1745 S. published in two parts The Worship and Love of God. tinued to write industriously various subjects of natural philosophy. and many of his MSS. are preserved in the Royal Academy of Sciences at Stockholm; but his career may be dated from the publication of the Prodromus Principiorum. In this work he attempted to account for chemical combination by a theory of the forms and forces of the particles of bodies, and to resolve chemistry into natural geometry, that it might have the benefit of first principles, and the rank of a fixed science. these forms he gave many delinea-tions. In approaching the human body he again insisted on the necessity for principl A knowledge of

opinions of all the schools of medicine | In Gt. Britain they may be divided since the days of Hippocrates. His works, however, are a dead letter to the medical profession. From 1745 S. entirely forsook science, returned from London to Sweden, and devoted himself to the study of Hebrew and the perusal of the Scriptures. He continued to discharge the duties of assessor of the Board of Mines till 1747, when he obtained permission to retire, retaining as a pension the salary of the office. During the remainder of his life, which was passed partly at London and Amsterdam, S. gained many believers in his doc-trines among the most distinguished men of the day. Bishop Filenius and Dr. Ekebon instigated a prosecution against him in the consistory of Göteborg, whence it was transferred to the diet; but S. came out of these trials with safety, unaccused by the diet, and protected by the king. S. died in Great Bath Street, Coldbath Fields, March 29. S.'s theological works As a specimen of are numerous. interpretation of the Holy his Scripture, the reader may consult the Apocalypse Revealed; for a concise view of his alleged experiences, the Heaven and Hell may be resorted to; for a view of that part of his system which relates to the creation and government of the universe, we recommend the perusal of the Divine Love and the Divine Providence; for his doctrine concerning the relation of the sexes, and its eternal origin and perpetuity, and for his code of spiritual legislation on marriage and divorce, see the Conjugal Love, one of the most remarkable of these works; finally, the student will find a compendium of the whole of the theology of the New Church in the True Christian Religion, the last and perhaps the finest of the writings of S. The whole of the theological works, originally published in Latin, have been translated into English, and some of them have passed through several editions both in England and in America. Translations of Heaven and Hell; Divine Love and Wisdom, and the Divine Providence are issued in Everyman's Library. S.'s theoin Everyman's Library. S.'s theo-logical MSS., which are preserved in the Royal Academy at Stockholm, are very voluminous. See Lives by E. Paxton Hood (1854), W. White (1868), E. Swift (1883), Garth Wilkinson (1886), B. Worcester (1907), G. Trobridge (1908); Documents concerning Life and Character, edited by P. L. Tedel (187-77) R. L. Tafel (1875-77).

re a sect who ion of Emanuel

into two portions, one of which forms the denomination known as such to the world; while the other portion remains without visible separation from the communion of the Estab-lished Church. The first public asso-ciation of the Swedenborgians took place in 1788, in Great Eastcheap, Since that time societies formed in nearly all London. been large towns in Britain.

Swedenborg Society, The (London), instituted in the year 1910 to translate publish the works and Emanuel Swedenborg. The society, while seeking more especially to make known to the world Swedenborg's theological writings, publishes also his scientific works, and is entirely unsectarian. It has published works of Swedenborg in eighteen different languages, including Hindi, Arabic, and Japanese, and all the principal European tongues. In collaboration with similar societies in America, it has undertaken the work of making of phototype reproductions phototype reproductions of the original MSS. of Swedenborg's writings, and copies of these will ultimately be deposited in all the principal libraries of the world. Free grants of the society's theological publications are made to clergymen, ministers, and theological students. Membership of the society is open to all persons interested in its work.

Movements, Swedish systematic gymnastic exercises intended to develop the body, and, more partivelop the body, and, more particularly, to cure bodily aliments. The originator of the modern school of Swedish medical gymnastics was Per Henrik Ling (1776-1839), the son of a minister. His health broke down through poverty and hard work, but, having recourse to teaching fencing for a living, he found that the regular exercise brought back his health. He afterwards elaborated a series of movements the practise of which he claimed to be a certain cure for most bodily ills. His claims were probably too extravagant, but the success which followed the teaching of his system by himself and his pupils brought it into good repute. There are now many varying sytems based on Ling's. See Cyriax, Elements of Kellgren's Manual Treatment; Wilde, Handbook of Medical Gymnastics.

Sweepstakes, a gaming transaction, in which one adventurer wins (sweeps) the stakes of himself and others; or a prize in a horse-race made out of several stakes. S. are lotteries, and therefore illegal, but money deposited in the hands of a stakeholder can, in nulgate the doc-urch signified by the money has been actually paid the Apocalypse. away on the determination of the bet. Sweet Bay, see LAUREL.

Sweetbread, a name given to certain glands of animals used as food. The pancreas of the ox or calf is most generally employed; it is palatable and digestible when well cooked, and is more especially suited for invalids,

Sweet Flag, or Acorus Calamus, the British species of its genus, which belongs to the Araceæ. The inflorescence has an aromatic scent.

Sweet Pea (Lathyrus odoratus), probably the most popular annual garden plant. It lends itself exceptionally to hybridisation, and indeed was, with the edible pea, the subject of Mendel's invaluable experiments. Its numerous varieties cover a very extensive range of colour, though deep blue and most shades of yellow were unknown in 1913. The ground should be well prepared for plants by deep digging, and the seed can be either sown where the plants are to bloom or preferably under glass early in the year, the seedlings being planted out with a good ball of soil and roots about mid-April. Support by means of tall sticks or strings should be given early, and when flowering starts liberal supplies of water and liquid manure and also regular picking of the flowers will prolong the blooming period and increase the beauty of the

· rand laceæ a. uatas known edulis). :ountries, where its tuberous roots are

eaten as potatoes.

Sweet William, or Dianthus barbatus, a species of Caryophyllacee often grown in British gardens on account of its bright flowers.

Swetchine, Madame Anne Sophie (née Soymanof) (1782-1857), was a maid of honour to the Empress Marie-Louise of the French. She married General S. when she was only In St. Petersburg she seventeen. held a brilliant position in the best society of the day, the salon over which she afterwards presided in Paris was permeated with the Catholic and counter-revolutionary ideas of De Maistre, Sainte-Beuve

called Madame S. Les fille cadette de

St. Augustin.

Sweyn I. (d. 1014), King of Denmark, was the son of Harold and the father of the King Canute, who descended on our shores. S. himself led numerous invasions against the Saxons, but his wars were carried on more with a view to extorting money from the English than with on more with a view to extorting money from the English than with the idea of attempting any colonies, tion of this land. S. came at a juncture in the history of Denmark when

the old northern paganism softening under the influence of

Christianity.

Swieten, Gerard, Baron van (1700-72), a Dutch physician, born at Leyden. He was professor of medicine at the university of his native town, and in 1745 became leading physician at the University of Vienna. His chief work was Commentaria in H. Boer-haavii Aphorismis de cognoscendis el curandis Morbis, 1741-72

Swietenia Mahogani, see Mahogany. Swift, the name of members of the Picarian family Cypselidæ closely allied to the nightjar, cuckoo, and woodpecker, but not to the swallow, a passerine bird to which it bears some external points of resemblance. The only British species (Cypselus apus) arrives in Britain in May, but makes a sudden departure in August for its winter quarters. It feeds entirely on small winged insects, and in its search for them exhibits remarkable powers of flight. It nests in holes in tall buildings, laying two or three large white eggs. The adult bird is about 7 in, long. The plumage is blackish brown except for a small greyish white patch under the chin. The tail is long and forked. An occasional visitor to Britain is the whitebellied or Alpine S. (C. melba). A remarkable S. is Salvin's S. (Panytila sancti-hieronymi), a native of Guate-mala, which builds a huge nest com-posed entirely of seeds and the bird's own salivary secretion. The famous ediblenests (q.v.) are made by Malayan swiftlets of the genus Collocalia in which the power of secreting saliva is so developed that the nests are composed entirely of it.

Swift, Deane (1707-83), was the cousin of Jonathan Swift. He was educated at Oxford, and took his degree in 1736, and after leaving college settled on his estate at Goodconege settled on his estate at Good-rich in Hertfordshire. He is chiefly remembered for An Essay upon the Life, Writings, and Character of Dr. Jonathan Swift, which he published in 1755, but he was also responsible for the volumes containing Swift's correspondence in the large octave addition of that author's weeks edited edition of that author's works edited

by John Hawkesworth, 1769. Swift, Jonathan (1667-1745), a man of letters, though born in Dublin, was of letters, though oorn in Dudin, was of English origin. He was educated at Trinity College, Dublin, and in 1692 became secretary to Sir William Temple. He hated his subordinate position, and finding that Temple made no effort to procure him advancement, he went to Dublia in 1694 was ordained and given the

Swift Park, where young Esther | Dunaff Head (4 m. in width) and on ('Stella') was now installed | extending inland for 25 m. Moor ohnson ('Stella') was now installed as a member of the household. He remained there until Temple's death (1699), when he went to Ireland, and received some minor clerical appointreceived some minor elerical appointments. He had read deeply, and already in 1697 had written The Battle of the Books, which with the still more famous The Tale of a Tub was published in 1704. When he came to England in 1705 and 1707 he made the acquaintance of the leading men the acquaintance of the leading men of letters and statesmen, and gradually became a power with the Tory ministers. His love-affair with Miss Vanhomrigh ('Vanessa') is related in the poem, Cadenus and Vanessa, but it was 'Stella' who had the first place in his heart, and his Journal to Slella makes very delightful reading. Whether he married her or not is one of the unsolved problems of literary Whether he married her or not is one of the unsolved problems of literary history. In 1713 he was appointed to the deanery of St. Patrick. He wrote many political pamphlets, the most famous of which are the Drapier Letters (1724). Gulliver's Travels was published in 1726. His last visit to England was paid in the following year, and the rest of his life was spent in Ireland. His brain became overelouded in 1758, and he never recovered his senses. He died in October, and was buried beside 'Stella' in his cathedral. Among his October, and was buried beside 'Stella' in his cathedral. Among his minor works are: A Meditation upon a Broomstick; The Beckerstaff Papers; a Broomstick; The Beckerstaff Papers; An Essay on Conversation, and A Complete Collection of Genteel and Ingenious Conversation. There is an edition of his works by Scott (1814), and a biography by Craik (1882), and the Correspondence of Jonathan Swift (4 vols.), edited by F. Elrington Ball (1912)

Swift, Theophilus (1746-1815), the son of Deane Swift. He was a man of eccentric habits and opinions, and was, in consequence, frequently engaged in unpleasant controversies, one of which led to a duel (1789) and one of which led to a duel (1789) and another to imprisonment (1794). He published The Gamblers, a poem (1777); Temple of Folly, in four cantos (1787); Poetical Address to His Majesty (1788); The Female Parliament, a poem (1789); The Monster at Large (1791); An Essay on Ping (1891) on Rime (1801).

on Rime (1901).
Swiftsure, a British battleship, launched in 1903 at Elswick, has a displacement of 11,800 tons, indicated horse-power of 12,500, and a speed of 20 knots. The name, originally 'Swiftsuer' (swift pursuer)

Swimming, the art of propelling oneself through water without artificial aid. S. is for man an acquired art, that is, certain movements which are not instinctive, at any rate among civilised peoples, have to be learnt and practised before the aspirant can expect to support himself in the water. By inflating his lungs with air, a man can cause his specific gravity to be about equal to that of water, so that floating without movewater, so that noating without move-ment is possible. In travelling through the water, a fair proportion of the body is not immersed, so that the displacement of water is lessened: more or less rapid movement is then necessary to prevent the body from sinking. The most generally useful series of movements used in S. is that known as the breast stroke. arms are pushed out in front of the arms are pushed out in front of the body near the surface, the fingers being closed and the palms down-wards, so that the thumbs nearly touch when at full stretch. The palms are then turned slightly out-wards and swept backwards until they are in line with the breast. The they are then quickly brought to the front of the chest and then thrust forward for the next stroke. While the arms are making the backward stroke the legs are drawn up with the heels touching and the knees pointing sideways. The legs are then kicked outwards, making a wide sweep and brought together when nearly straight, being drawn up again during the next arm stroke. The movements should be vigorous but not jerky, and the joints should not be perfectly rigid during any part of the stroke. Another method of S. is the back stroke, in which the same leg movements are used as in same leg movements are used as in the breast stroke; the arms, however, are brought through the air to a posi-tion in advance of the head and then swept round under the water near the surface until they touch the hips. In the side stroke the lower arm makes a deep sweep downwards, the upper arm moves from head to side, and the legs are kicked apart and smartly closed. The over-arm stroke differs in that the upper arm is brought through the air with the hand at the level of the face, the hand dipped in with fingers pointing launched in 1903 at Elswick, has a hand dipped in with fingers pointing displacement of 11,800 tons, indidownwards, and a vigorous push cated horse-power of 12,500, and a backwards effected with the full speed of 20 knots. The name, breadth of the palm. The trudgen originally 'Swiftsuer' (swift pursuer) stroke involves pulling each arm was introduced into the British clear of the water to get position for navy in 1573.

Swilly, Lough, an inlet of co. Done-gal, Ireland, entering from the Atlantic between Fanad Point and far as the knee and then brought

alternately down upon the surface which was edited by John Nichol, with a sharp shock. S. races are particularly popular in England, Australia, and America. There are championships for many distances and various styles. A mile was trandous tyles. A mile was trandous tyles to the mile was trandous tyles. The mile was edited by John Nichol, was versed by D. Billington, in 1907, in 24 mins. 42; secs. C. M. Daniels, of America, swam 100 yds. in 553 secs., a performance which was a great improvement on championship efforts for many years back. Great interest has from time to time been taken in attempts made to swim the English Channel. Captain Matthew Webb accomplished it in 21 hrs. 45 mins. in 1875. The feat was duplicated in Sept. 1911 by T. W. Burgess, who took 22 hrs. 35 mins. to complete a Sachs, The Complete Swimmer; Sinclair and Henry, Swimming; Ralph Thomas, Swimming.

Oxford, where he remained for three years. He left without a degree, years. He left without a degree, however, the reason probably being that, like most young men of marked individuality, he never became interested in the official curriculum; he did not leave the university with-out laurels, for in 1858 he won the Taylorian prize for French and Italian, while already he was known as a promising writer. Whon still in his teens he had contributed verses to Frazer's Magazine, and during his Balliol days he wrote a few things for a collegiate journal, The Dark Elue, notably a fine essay on Simeon

a close friendship was formed between the two, while it was to Rossetti that S. dedicated his first volume of poetry, The Queen Mother (1860). When travelling in speedily Italy, shortly after leaving Oxford, S. had the good fortune to meet Landor; but soon the young poet was back in England, and on going to live in London his intimacy with Rossetti began to deepen apace. The latter painted his portrait, while in 1862 the two friends, along with George Meredith and brother, William, took Rossetti's ciair and Henry, Swimming; Ralph Thomas, Swimming.

Swinburne, Algernon Charles (1837-1909), one of the greatest English poets of the nineteenth century, born in London. His father was Admiral Charles S., second son of Sir John S., Bart., of Capheaton, Northumberland, while his mother was the Lady Henrietta Jane, daughter of the third Earl of Ash-burnham; and it is interesting to find that the poet, an ardent republican throughout the greater part of his life, came of a staunch Jacobite stock. For the Swin-burnes, like many other Northumberlan families, played a considerable part in the rising on behalf of the Chevaller de St. George in 1715; nor did the poet's democratic ferrour prevent him from taking a certain pride in this, and in Jacobite Song the impassioned loyalty felt of old by the partisans of the Stuarts. As a boy S. lived sometimes at Cap. As a boy S. lived sometimes at Cap. But in general his life Dene in the Isle of Wight, while in 1852 he went to Eton, and five years later he proceeded to Balliol College, Oxford, where he remained for three the publication of his Poems and Brolled in 1865 he issued his memorable tragedy, Atalanta in Calydon, while brother, William, took a house toek and in 1865 he issued his memorable tragedy, Atalanta in Calydon, while he publication of his Poems and Ballads. This book raised a storm of abuse from many critics, these being repelled by the sensuality and henceforth his roputation was an fatl accompli in the world of admit the new singer's lofty skill, the new singer's lofty skill the new singer's lofty skill, the new singer's lofty skill, the new singer's lofty skill the new singer's lofty skill, the new singer's lofty skill the new singer's lofty skill, the new singer's lofty skill the new singer's lofty skill, the new singer' brother, took a together at Cheyne Walk, Chelsea. one, its tenor broken only by occasional trips to the continent and by the publication of his books; while he always shunned popular applause and only spoke in public once, the occasion being a dinner of the Royal Literary Fund, where he replied to the toast of 'The Imaginative Litera-ture of England.' When the home at Chelsea was broken up, he went to live in chambers in North Crescent. while in 1879 he removed to Putney, taking a house there along with Mr. Theodore Watts-Dunton; and here he lived chiefly until his death, which occurred on April 10, 1999. Fourteen years prior thereto a third likeness of him had been done—a Solomon; while he also wrote both red chalk drawing, the work of Mr. in prose and verse for another Oxford Will Rothenstein, and this was an periodical, Undergraduate Papers, quired lately by the Dublin Gallery

of Modern Art, while the portrait by Rossetti, cited above, is now in the possession of Lady Battersea, London. S.'s voluminous prose work includes two stories, Dead Love and Love's Cross-Currents, but he had slender skill as a teller of tales, and it is on his critical studies that his fame as a

prose author really rests. S.'s collected poems were issued in 1904, and his collected dramas in 1905 and 1906. The following are the more important of his prose works: William Blake, 1868; Essays and Studies, 1875; A Note on Charlotte Brontë, 1877; A Study of Shakespeare, 1880; Miscellanies, 1886; Study of Victor Hugo, 1886; Studies in Prose and Poetry, 1894; The Age of Shakespeare, 1908. See also W. M. Rossetti, Swinburne's Poems and Ballads, 1866; T. Wratislaw, Swinburne (English Writers of To-day), 1900; G. E. Woodberry, Swinburne S.'s collected poems were issued in 1900; G. E Woodberry, Swinburne (Contemporary Men of Letters), 1905; Edward Thomas, Swinburne: a Critical Study, 1912; and John Drinkwater, Swinburne: an Estimate, 1913.

Swinburne, Henry (1743-1803), a traveller, born at Bristol. After the death of his brother in 1763 he visited taly and learned the language, and in 1774 went to the Pyrenees and travelled through Spain, publishing Travels through Spain in 1779. He next visited the two Sicilies (1777 and next visited the two Sicilies (1777 and 1778), and on his return journey touched at Vlenna, Frankfort, and Brussels. He was again in Vienna and Italy in 1780, and stayed in Paris, 1786-88. Besides the work mentioned above, he published Travels in the Two Sicilies, and both of his books were illustrated with excellent His letters were published posthumously under the title of The Courts of Europe at the Close of the

Last Century. Swindling, see FRAUD.

Swindon, a market tn. and municipal bor. of Wiltshire, England, 28 m. from Bath and 77 m. from London. It is made up of two parts, Old and New S., the latter having grown up around the locomotive department and workshops of the G.W.R., which were established in 1841. It is an important railway junction. (1911) 50,771. Pop.

Swineford, a market tn., co. Mayo, Ireland, near the R. Moy, 15 m. N.W. of Ballyhaunis. Pop. (1911)

1400.

Swinemünde, a seaport and tn., Swhemman, it seaport and the stand of twill rain for forty days.

Usedom, 35 m. by rail N.N.W. of Stettin, is well fortified and an important shipping centre. It was the port of Stettin before the deepening except the principality of Liechten-of the R. Oder (1900-1). Pop. 14,198.

Swineshead, a tn. and par. of Lincolnshire, England, 6 m. S.W. of Boston by rail; has many interesting remains and an endowed free

ing remains and an endowed free school. Pop. (1911) 1800. Swinton: 1. A tn. of the W. Riding of Yorkshire, England, 10 m. N.E. of of Yorkshire, England, 10 m. 11.21. 5. Sheffield; has railway works, and manufactures pottery, glass, and manufactures pottery, glass, and bottles. Pop. (1911) 13,658. 2. A tn. of Lancashire, England, 5 m. N.W. of Manchester. Pop., with Pendlebury

(1911), 30,759.
Swiss Guards, a famous regiment of Swiss mercenaries in the French army, constituted in 1616. They were conspicuous for their bravery in the defence of the Tuileries (1792), which was commemorated in 1821 by the great lion outside one of the gates of

Lucerne.

Switch: 1. In electricity, a mechanism for making or breaking a circuit. or for transferring a current from one conductor to another. 2. On a railway, a device for moving a small section of track so that rolling-stock may be run or shunted from one line

of track to another.

Switchback was originally a term applied to a railway which modified the steepness of a declivity by progressing alternately in each lateral direction as well as in the vertical direction up the slope. The railway, which was used for carrying coal, in which the trucks were carried down inclines by their own weight and assisted up the inclines by a stationary engine, was afterwards called a switchback railway. Still later the name was given to the elevated railways at exhibitions, fairs, etc., in which the cars are hauled up to a height by a cable, and then descend gradually, though rapidly, by a series of sharp ascents and descents. In this signification 'switchback' is still used, although such names as 'scenic mountain' railways are more popular.

Swithin (or Swithun), Saint (d. 862), Bishop of Winchester, was probably a secular clerk. He was the adviser of Egbert and tutor to his son Ethel-wulf, who made him bishop of Winchester on his accession (852). body having been buried outside the church at Winchester, the monks deerected cathedral (971), but were prevented from doing so by rain, which did not cease for forty days. Hence the popular superstition that if it rains on St. Swithin's Day (July 15)

burg, and the small republic of speaks Italian and one (Grisons) burg, and the small republic of Andorra), consists of the confederation of twenty-two self-governing cantons, bounded on the N. by Germany, W. by France, E. by Austria 796,244 French, 301,325 Italian, and Liechtenstein, and S. by Italy, 12,599,154 spoke German, and Liechtenstein, and S. by Italy, 12,599,154 spoke German, 13,834 Roumansch. The following It is 220 m. in length from E. to W., about 137 m. from N. to S., and is the date of their entry into the Conseparated from the adjacent countries federation, and the density of the by the Alnine barriers. Fifteen of the

by the Alpine barriers. Fifteen of the population per square mile, while the cantons are German speaking, five initials, G., F., I., or R., indicate speak French, while one (Ticino) which language is spoken—

CANTON	Date of Entry	Area	Pop. in 1910	Pop. per
Zürich, G. Bern, G. Luzern (Lucerne), G. Uri, G. Schwyz, G. Unterwalden	1351 1353 1332 1291 1291	666 2,657 597 415 351	500,679 642,744 166,782 19,700 58,347	751.7 249.1 288.0 53.1 166.2
Upper, G. Lower, G. Giarus, G. Zug, G. Fribourg (Freiburg), F., G. Solothurn (Soleure), G.	1291 1291 1352 1352 1481 1481	183 112 267 92 644 302	17,118 13,796 33,211 28,013 139,200 116,728	93.5 123.1 124.3 304.5 216.1 386.5
Basel (Bâle)— Town, G Country, G Schaffhausen, G Appenzell— Outer, G.	1501 1501 1501	14 163 114 101	135,546 76,241 45,943 57,723	9681.5 467.7 403.0 572.0
Inner, G. St. Gallen (St. Gall), G. Grisons (Grafibunden), I., R. Aagau (Argovie), G. Thurgau (Thurgovie), G. Ticino (Tessin), I. Vaud (Waadt), F. Valais (Wallis), F., G. Neuchâtel (Neuenburg), F.	1513 1803 1803 1803 1803 1803 1803 1815	779 2,773 542 381 1,088 1,244 2,027	14,631 301,141 118,262 229,850 134,055 158,556 316,428 129,579 132,184	239·8 385·0 42·6 424·0 351·8 1453·4 253·9 423·6
Genève (Geuf), F Total	1815	108 15,976	3,741,971	234.8

snow-capped mountains, with abys-and Glarnor Alps are situated in the mal depths and enormous glaciers, which form a distinct contrast to the centre of the country. The highest grassy valleys, the wooded upland peak is Monte Rosa, on the Italian slopes, the vineyards, the rich tivated fields, the expansiv beautiful lakes, and the streams. On its pasture land thousands of cattle are reared and fattened, while the ibex and chamois roam among the rocky crags and woods. The chief physical feature is the vast nalpine system, known by various names in different localities, e.g. the Jura Mts. extend along the W. ing to the du boundary; the Rheetian Alps cross the E. frontier into the Tyrol; the Bernese Alps occupy the south-cen-

S. probably exceeds every other tral part of the country: the Valais country on the globe in the diversity Alps lie on the southern border; the of its scenery, including as it does vast Lopontine Alps, the Rheinwald Alps, 1 highest mountain

being only exceeded

1913), and the Semmering. Light railways ascend many of the peaks, the Jungfrau railway running to the summit (13,248 ft.) from a height of 6770 ft. There are upwards of 1000 glaciers in S., the largest being the Aletsch in the Bernese Oberland, 13 m. in extent, which descends from the slopes of the Aletschorn (13,721 ft.) to about 5450 ft. Of the many beautiful lakes within, or partly within, the limits of the country, the within, the limits of the country, the following are the most important: Geneva (224 sq. m.), Constance (208 sq. m.), Neuchâtel (92 sq. m.), Lago Maggiore (84 sq. m.), Lucorne (44‡ sq. m.), Zürich (34 sq. m.), Lugano, Thun, Bienne, Zug, Brienz, and Morat, the last six being under 20 sq. m. in extent. The principal rivers of S. are the Rhone, Rhine, Inn, Arve, Reuss, Limmat, Aar, and the Thur, the Aar being the most important entirely The three within Swiss territory. The three rivers first noted have their sources in the Alpine glaciers: the Rhine flowing N. and N.W. empties into the North Sea, the Rhone takes an E. and then southerly course to the Mediter-ranean, while the Inn flows N.E. to join the Danube. Among the valleys may be mentioned the famous Yal de Travers and the valley of the Inn or the Engadine. There are grand waterfalls at Staubbach in the canton of Bern, which drop 980 ft., and at Schaffhausen on the Rhine, which drop over 100 ft. in three leaps. The forests of S. cover 3290 sq. m., most of them belonging to municipalities and other corporations, and about 30 per cent. belonging to private individuals. The chief towns, with their pops., are Zürich (189,088), Basle (131,914), Geneva (125,520), Bern, the cap. (85,264), Lausanne (63,296), St. Gall (37,657), Chaux-de-Fonds (37,626), and Lucerne (39,152).

The present formation of the mountain masses of S. is the result of extrome pressure at successive periods from the N.E. and S.W., which has caused the upheaval of the earth's crust, in the course of which the strata have been crumpled, shattered, and even overturned, presenting an endless variety of shapes. The lofty ridges consist principally of crystal-line schists in conjunction with granite, the outliers containing fos-

siliferous sedimentary rocks.

As regards religion, there is full liberty of conscience and of creed, and no man is required to pay taxes to maintain any religion to which he does not belong. Jesuits and their affiliated societies are barred, and the foundation of new religions, orders, or convents is not allowed. In 1910 the Protestants numbered 2,108,590, organised landsturm.

St. Gothard, the Lötschberg (opened Catholics 1,590,792, and Jews 19,023. 1913), and the Semmering. Light The Protestants are in the majority Catholics 1,520,732, and sews 13,523.
The Protestants are in the majority in the cantons of Zürich, Bern, Vaud, Neuchâtel, and Basel, while Catholics predominate in Fribourg, Valais, Ticino, and the Forest cantons. In all the cantons education is compulsory and free. There are 996 infant schools, with 1206 teachers and 50,842 pupils; 4690 primary schools, with 11,887 teachers and 522,383 pupils; 636 secondary schools, with 1961 teachers secondary schools, with 1961 teachers and 53,773 pupils; 41 middle schools, with 915 teachers and 13,477 pupils; and 49 normal schools (public and private), with 577 teachers and 3399 pupils. In addition to these there are commercial schools, industrial schools, improvement schools, technical improvement schools, technical schools, and schools of agriculture, horticulture, dairy management, domestic economy, and viticulture. S. has seven universities, which are more or less modelled on those of Germany. with four faculties-theology, law. medicine, and philosophy—governed by a rector and a senate. The Basel University was founded in 1460, Zürich Oniversity was founded in 1800, Zurich in 1832, Bern in 1834, Geneva first as an academy in 1559 and then as a university in 1873, Fribourg in 1889, Lausanne (academy 1537) in 1890, and Neuchâtel (academy 1866) in 1909. Fribourg and Neuchâtel uni versities have no faculty of medicine.

S., although chiefly an agricultural country, cannot grow enough crops to support its population, so that the ma-jority of the food stuffs are imported. The productive land is cut up among some 300,000 peasant proprietors, who raise rye, oats, barley, and potatoes, and manufacture cheese, condensed milk, wine, and tobacco. Nearly 30 per cent. of the entire area is unproductive. Stock-raising is extensively engaged in, mainly horses, cattle, sheep, goats, and pigs. Bee-keeping is a thriving industry. There are five salt-mining districts—at Schweizerhalle, Rheinfalden, Ryburg, Kaiseraugst, and Bex; cement works in the Val de Travers; and numerous breweries and distilleries. Among other manufactures are silk and cotton goods, clocks and watches, chemicals, embroidery, boots and shoes, motor cars and machinery. In 1912 the exports amounted to £54,303,866, and the imports were valued at £78,549,416. It is estimated that tourists bring £4,000,000 into the country annually.

The national militia is the defending force of S., and service in it is universal and compulsory. The total number of men that could be put in the field against a possible invader is about 280,000 men all told, this number including 66,500 men of the Liability to

seventeenth to the end of the fortyeighth year. The fortifications of St. Maurice and the St. Gothard Pass are being strengthened, £220,000 having been granted for this purpose in 1910. The money spent annually on the army amounts to £1,720,000. The army amounts to £1,720,000. revenue in 1912 was estimated at £3,710,400, and the expenditure at £3,863,200, and the public debt of the confederation stands at about £5,000,000.

There are 3131 m. of railway in S., including 1494 m. of Swiss lines, 42 m. of foreign lines, the balance being made up by secondary lines and tram-The post, telegraph, and telephone arrangements are complete and satisfactory. The new National Bank (opened 1907) will eventually have the sole privilege to issue Swiss bank notes, other banks being allowed a period of three years in which to call in their outstanding issue. canton possesses its own judicial system of civil and criminal procedure; the High Court, called the Bundesgericht or Federal Tribunal, sits at Lausanne, and has final jurisdiction in suits between the Confederation and the cantons.

Legislative and executive authority are embodied in a parliament consisting of two chambers—a National Council and a State Council—the former consisting of 167 members directly chosen by the people in general election, and the latter composed of 44 members (two for each canton), whose election and term of office depend on the individual canton. All representatives, either of the national or state councils, are remunerated, the national members being elected every three years. Three of the cantons are sub-divided-Basel, Appenzell, and Unterwaldbut each sub-division is represented by a member in the state council.

History.—The original inhabitants of S. were the Helvetii in the north-west and the Rhætians in the south east. The Roman conquest of these tribes began as early as 107 B.C., in which year they were defeated in Southern Their subjection dates from 58 B.C., when Julius Cæsar acquired their dominions and organised them as a Roman province. Christianity was introduced between 300 and 400 A.D. The ancestors of the modern Swiss are the Germanic tribes who began to overrun the Roman empire. The Alemanni settled E. of the Aar about 406 A.D., and the Burgundians in the S.W. in 443 A.D.. The German Christians about peoples became Christians about 600-650, but the Helvetil were not converted till somewhat later. Between 700 and 1200 S. was under the

serve in the army extends from the influence successively of the descendants of Charlemagne, the German emperors, and the Zaringen dynasty. Charlemagne (768-814) included S. in his territory, and ruled over it with the same firm and just sway as he did the rest of his domains. At his death this realm fell into confusion, and in the subsequent partition of his territories half of modern S. was allotted to the E. Frankish kingdom, and half to Lorraine. In 888 Rudolf the Guelf founded the kingdom of Burgundy, and in 917 Alamanni became an independent duchy. In 1038 Burgundy, Alamannia, and Rhætia fell to the Salic king, Henry III. From 1097 till 1218, the Zäringen dynasty ruled well and justly. A period of anarchy ensued, till in 1273 Rudolf of Hapshurg begame apprages. On his death burg became emperor. On his death, in 1291, the First Perpetual League of the three Forest States (Uri, Schwyz, Unterwalden) was formed. In 1332 Lucerne, in 1351 Zürich, in 1352 Zug and Garus, in 1353 Bern, and Add de the League following were added to the League, following on a war with Austria. In 1415 war with Austria was renewed, and Aargau was added to the Confederation. From this period dates the rise of Swiss education, art, and industry. From 1474-77 the Confederation were engaged in war with Charles the Bold of Burgundy, deteating him at Granson and Morat (1476). In 1481 Freibourg and Soleure came into the Confedera tion. In 1499 Maximilian attempted to bring S. again under the empire, but was defeated. The independence of S. really dates from the Confedera-tion of the Thirteen States (see above). The Reformation led to internal dis-sension, as the N. generally followed the teachings of Zwingli (and later of Calvin), while the Forest States re-mained Roman Catholic. The war which broke out in 1531 settled the relative boundaries of the states owning the two creeds. In 1536 Berne took the Vaud from the Dukes of took the vand from the Dukes of Savoy. In 1648 S. was acknowledged by the Powers as an independent state. The history of the 17th and 18th centuries is one of a patriciate in Bern, Freibourg, Soleure, and Lucerne, and of civic oligarchies in Basel, Zürich, and Schaffhausen. During the whole of this period the ing the whole of this period the peasantry were much oppressed, and their attempt in 1653 to secure better conditions crushed. S. shared, however, in the éclaircissement movement in France; but on the outbreak of the French Revolution (1798) it was seized by France. In 1815 its independence was restored, with a constitution known as the Federal Pact. During the 19th century religious differences led to bitter controversy and to blows. In 1847 a savage war

of peace signed, giving the Protest-ants nearly all they had fought for. In 1874 a Federal revision was carried, and in 1891 a demand for popular initiative for measures was carried. In 1908 S. entered into an international convention for compulsory arbitration at the court of the Hague.

Switzerland, 1890; Dändliker, Short History of Switzerland, 1890; Dändliker, Short Hist. of Switzerland, 1899.)

Literature.—Swiss literature, coming as it does from a number of races unconnected in origin and history, must be regarded rather as a collection of local literatures than as one single thing. Ekkehard's Wallharilied (c. 940) is a poem in Latin hexameters which deals with Walter of Aquitaine. Of mediewal Swiss literature we have French and German 'courtly' ro-mances on 'France, Britain, and Rome the great'; German_lyrics; Rome the great'; German lyrics; translations of the Bible into French; miracle and morality plays in French; and vast compilations like Grandson's Mireour du Monde. The Swiss re-formers and humanists are responfor much valuable work. Zwingli (1484-1531) translated the Bible into German, while the clear and incisive polemical style of Calvin (1509-64) has raised him to a high place among French stylists. Scaliger is famous as a scholar. Among poets of the same epoch should be noted of the same epoch should be noted gengenbach (who wrote German) and De Bèze (who wrote French), and among German chroniclers Stumpf and Bullinger. For a time Swiss literature declined, but in the 18th century came a reawakening. The works of Crouaz and Ruchert, and Muralt's Letters on the English and French (in French) are signs of this new spirit. The philosopher Haller was a sturdy upholder of England in intellectual matters, and was much influenced by the inductive method of Bacon. He published, in 1732, in German, an Essay on Swiss Poetry, and his own poems are full of grace Along with him and tenderness. should be mentioned Bodmer, who translated Milton into German (1732). translated alliton into German (1712). The greatest name of all in Swiss literature is that of J. J. Rousseau (1712-88) (q.r.), whose work does not have the disciple. call for treatment here. His disciple. Pestalozzi, is one of the greatest of educational reformers. Vinet (1797-1847) is the 'Protestant Pascal.' His works (in French) are marked by incisive of the city of Dublin, on the Swords ness and purity of style. The novels R.; has ruins of a tower and abbey. of 'Gotthelf' (Albert Bitzius, 1797-Pop. (1911) 1900. 1854) rank among the best works of

broke out between Protestants and domestic fiction in German, and his Roman Catholics on the question of the suppression of the Catholic Sonderbund. In 1848 a new federal constitution was adopted, and the terms of Swiss humorists and poets. He of peace signed, giving the Protestwrote in German, as did C. F. Meyer, also a poet. There are also many con-temperary Swiss poets and novelists. Of novelists we may note Monnier. Tissot, Combe, and Rannez, and of poets Tazan, Cougnard, Dalcroze, all of whom write in French. (See Rossel and Jenny, Hist. de la Litt. (Sec Suisse, 1910.)

Sword (A.-S. sweard; Dutch swaard; Low Ger. sweerd; Dan. sraerd, a sword, allied to the Sanskrit caru, a sword, tailed to the Sanskrit Gard, a spear or dart), an offensive weapon, having a long metal blade (usually made of steel), either straight and with a sharp point for thrusting, as the rapier; with a sharp point and one or two cutting edges for thrusting and striking, as the broadsword: or curved with a sharp convex edge for striking, as the scimitar; or a broad. short blade with a slightly curved point, as the falchion. Sabres, used by dragoons, are heavy Ss. used chiefly for cutting. Sailors use the cutlass, which is a broad, straight S., about 3 ft. in length. The blade is fitted into a handle or hilt, which is protected by a guard. The hilt has, in various countries and through the ages, assumed a variety of shapes, either bejewelled, ornate, or plain. The blade is carried in a sheath or scabbard to prevent the weapon doing harm when not in use. earliest Ss. found were fashioned of stone or bronze, somewhat daggerlike in appearance. These were followed by Ss. of iron, short at first and lengthened later. The ancient Britons used Ss. of enormous length and weight.

Sword-fish, or Xiphias gladius, the name given to the single species of the mackerel-like family Xiphiidæ. Its distribution is practically universal, but it is found most commonly off the shores of N. America, and only occasionally occurs round the British Isles. The average size of the fish is 7 ft., but in some cases it attains a length of from 12 to 15 ft. It is peculiar in possessing an elongated snout formed from the upper jaw, and with this sword-shaped weapon it can pierce through the planks of ships or spear its prey, such as mackerel and herring. A very different fish, Belone vulgaris, a member of the family Scombresocide, is also known as the sword-fish.

Swords, a tn. in the co. and 3 m. N.

Sybaris, a celebrated Greek tn. in

Lucania, situated between the rivers suburb of Christchurch (q.v.), in Selsvharis and Crathis at a short dis-wyn co., South Is., New Zealand. tance from the Tarentine Gulf. Ιt was founded 720 B.C. by Acheans an

...me so notorious for their love of luxury and pleasure that their name was employed to indicate any voluptuary.

Sybel, Heinrich von (1817-95), a German historian, held the chair of history successively at Bonn (1844, 'privatdocent' in 1841), Marburg (1846), Munich (1856), and from 1861 till 1875 again in Bonn. No better acknowledgment of his debt to Ranke, his master, can be found than his own critical and soberly impartial Geschichte des ersten Kreuzzuges (1841) and Geschichte der Revolutionziet, (1853-58 1789-1800 and 1872-74). His Begründung des deutschen Reiches Wilhelm I. (1889-94) is a monumental work.

Sycamine, a tree mentioned in Luke's gospel, is usually considered to be the black mulberry, or Morus

nigra.

Sycamore (Acer pseudo-platanus), a handsome spreading tree (order Acerineæ), introduced into Britain in mediæval times and now thoroughly naturalised. It bears large five-lobed serrate leaves and pendulous racemes of green flowers, followed by reddishgreen winged seeds (Samaras). wood is white and fine-grained, and is much used by turners. The tree is often planted on account of its rapid growth to form a screen for valuable fruit trees.

Sycophant (Gk. συκοφάντης), literally, an informer concerning the sacred figs (from σῦκον, fig, and φαντης, any one who made something known, from bairer, to see or discover). The Athenians had a law which punished by death those who stripped the figs from the fig trees consecrated to Minerva, while people who informed on such malefactors became the were rewarded. Ιt custom for evil-doers to steal these figs themselves and then accuse those whom they wished to injure. Hence, by a figure of speech, the term S grew to mean any one guilty of a hypocritical or blackmailing offence. It is thought in some quarters that the penalties attaching to dealing with figs in Athens were due to considerations octroiexcise and rather than to religious motives.

Sycosis, an inflammatory disease of the hair follicles, characterised by papules and pustules. See RINGWORM.

Sydenham: 1. A dist., S. of London, partly in the metropolitan bor. of Lewisham, 6 m. S.S.E. of St. Paul's. in Kent, England.

wyn co., South Is., Pop. less than 10,000.

Sydenham, Charles Edward Poulett-Thomson, first Baron (1799-1841), an ity English statesman. At the age of sixteen he was placed in his father's business at St. Petersburg, but in 1824 he returned to England, where he assumed chief management of the London business. Sanguine and am-London business. Sanguine and ambitious, S. set his heart upon entering public life, he became M.P. for Dover in 1826, and his rise from this date was very rapid. M.P. for Manchester many times from 1832; president of Board of Trade, 1834; governor of Canada, 1839; and raised to the peerage, 1840. His Memoirs have been written by his brother, Mr. Poulett, Serone. Poulett Scrope.

Sydenham, Floyer (1710-87). English classical scholar, was finally defeated by the popular indifference to learned works in his life-long struggle to achieve a complete English translation of Plato. For he died. his task still uncompleted, in a debtor's prison, the victim of a vic-tualler's suit. The London Literary Fund Society was founded with the object of averting similar tragedies

object of averting similar tragedies in the future.

Sydenham, Thomas (1624-89), an English physician, was born in Dorsstshire, and admitted a commoner of Magdalen Hall, Oxford, in 1642. About 1648 he obtained a fellowship of All Souls' College. Subsequently he quitted Oxford, and having taken the degree of doctor having taken the degree of doctor of medicine at Cambridge, he became a licentiate of the College of Physicians, and settled in London. In 1666 S. published his first work, which consisted of observations upon An enlarged edition of this treatise appeared under a new name in the year 1675. Remarks on the epidemic diseases of London from 1675-80, a treatise on dropsy and on the gout, and a tract on the rise of a new fever, were his principal other publications. His works were translated by Dr. Swan; the best edition of it is that of Dr. Wallis, published in 1789.

Sydney: 1. The largest city of Australia, cap. of New South Wales, situated on the S. side of Port Jackson and the E. shore of Darling Harbour, about 4 m. from the Pacific Ocean. Its extensive frontage is occupied by wharves and quays, where the largest ocean-going steamers can be accommodated, facilities which have made :

seaport in th city is well

S.E. of St. Paul's. imposing edifices and substantial 2. A southern business houses. Among them may

Sydney

St. Mary's Cathedral (Roman Catho- and laurvikite (augite S.), which lic), the university, the town hall, occurs in S. Norway and also near Government House, etc. The university was founded in 1850, is sub-augite Ss. are termed monzonites. sidised by the government, and, with the addition of special grants, receives £18,000 per annum towards its upkeep. It is attended by about 1400 students, and there are affiliated to it theological colleges and a college for women. The older portions of the city are being demolished, to be replaced by wider streets and handsome buildings. S, is a naval station of the first class, with dockyards, victualling yards, and coaling depots. On Garden Is, a well appointed naval establishment has been erected. Other islands in Port Jackson are Shark Is., used as a quarantine station, Spectacle and Goat islands, depôts for explosive stores, Clark Is., a popular wateringplace, and Cockatoo Is., with exten-The sive dockage accommodation. The city is embellished with several fine parks and other open spaces, the principal being the Domain, Centennial, Moore, Belmore, and Wentworth parks, and the Botanical Gardens. The south shores are indented by numerous bays, whose waters are filled with shipping from all parts of the world. Over 7,000,000 tons of shipping entered and cleared at S. in 1910. The industries include besides minor manufactures, the manufacture of textiles, steel, and iron goods, machinery, coaches, etc., but S. is primarily a commercial centre. Pop. (with suburbs and shipping) 636,355. S. was founded by Captain Arthur Philip, who had been sent to Australia to establish a penal colony. He landed at Botany Bay in 1788, but finding it unsuitable for settlement, he proceeded to Port Jackson, where he formed the nucleus of what is now the premier city of the Commonwealth. 2. A tn. and seaport of Cape Breton Is., Canada, 18 m. N.W. of Louisburg. It is the centre of a coal-mining region, with found-ries, blast furnaces, coke ovens, and gasometers. The International Railway has its terminus here. 17,617.

Sydney, Algernon, sec SIDNEY. Syene, ancient name for Assouan

Syenite, a plutonic, granitoid, igsyenic, a phiconic, gramon, as neous rock (sub-acid), named after Syene, in Upper Egypt, from where it was obtained for ornamental or architectural purposes. It differs from granite in the absence of quartz and the replacement of mica by hornblende. Ss. are not largely developed in Britain, but are found in Norway and Sweden, the Tyrol, and U.S.A., etc.

be mentioned St. Andrew's Cathedral, names. thus: borolanite (leucite S.)

Sylburg, Friedrich (1536-96), a German classical scholar, was a farmer's son. At Frankfurt (from 1583) and later at Heidelberg (from 1591) he brought out wonderfully accurate editions of Greek texts, among them being editions of Aristotle, Herodotus. Pausanias, Dionysius of Halicarnassus, Justin the Martyr, Xenophon, and of ancient historical writers (Romanæ Historiæ Scriptores).

Sylhet, the cap. of a dist. of its own name, Assam, India, on the Surma R., 49 m. S. of Shillong, with various manufactures. Pop. 15,000. The dist. is 5400 sq. m. in area, with a pop. of 2,250,000.

Syllabub, a culinary preparation, formerly much more used than at present. It consists of sugar and cream flavoured with brandy, sherry, and lemon rind and juice, worked into a froth, and served up in that

state in glasses.

Syllabus, Papal, the name given to two lists of heresies and errors condemned by Papal authority. better known is the syllabus of Pins IX. (1864) which condemned no less than eighty errors dealing with almost every department of modern thought.
The syllabus of Pius X., the decree Lamentabile sine exitu, was issued in 1907, and condemns the chief tenets of modernism in sixty-five theses. This syllabus is supplemented by the encyclical Pascendi gregis of the same year, and by the oath against modernism fixed in 1910.

Syllogism (σv^{μ}) , together, $\lambda \sigma_{\gamma v_{\gamma}}$, thought, i.e. the joining together in thought of two propositions), 'the act of thought by which from two given propositions we proceed to a third proposition, the truth of which necessarily follows from the truth of these given propositions' (Jevons). The two first propositions in the S. are called the premises and the last the conclusion, e.g. mercury is not solid, mercury is a metal; therefore some metal is not solid. The three propositions of a S. are made up of three ideas or terms, called the major. the minor, and the middle. The subject of the conclusion, which necessarily follows from the premises, is called the minor term; its predicate is the major term, and the middle term is that which shows the connection between the major and minor terms in the conclusion. Ss. are sometimes divided into single, complex, conjunctive, etc., and sometimes into categorical, hypothetical, conditional. Special types receive special etc. The special rules of the S, are

(1) Every S. has three, and only three, terms. (2) Every S. contains three, and only three, propositions. (3) The middle term must be distributed (i.e. taken universally) once at least, and must not be ambiguous. (4) No term must be distributed in the conclusion which was not distributed in one of the premises. (5) From negative premises nothing can be inferred. (6) If one premise be negative, the conclusion must be negative; vice versa, to prove a negative con-clusion one of the premises must be negative; and as corollaries from the above. (7) From two particular premises no conclusion can be drawn. (8) If one premise be particular, the conclusion must be particular (Jevons). The quantity and quality of propositions, in logic, are marked by arbitrary symbols, as A, E, I, O; and every assertion may be reduced to one of four forms—the universal affirmative (A), the universal negative (E), the particular affirmative (I), and the particular negative (O). From these, by combination, all Ss. are derived. To remember the figures certain curious words are used by certain curious words are used logicians; thus, under the first figure we find Barbara, Celarent; under the second, Camestres, Baroko; and under the third, Bokardo, Feriso.

The first of these represents to the second s mood, i.e. the designation . propositions of a S. accord

the first resource of fallacy.

Sylphs are explained by Paracelsus as elemental spirits of the air, just as the salamanders are of fire and the nymphs of water. By nature they are half fairy and half mortal, Per-haps Pope's description of them in his skilfully-contrived Rape of the Lock is responsible for the word 'sylph' being used of a slender, graceful maiden.

Sylt, a N. Frisian is., forming part of the Prussian prov. of Schleswig-Holstein. It is the largest of the group, having an area of 38 sq. m. Its chief tn. is Westerland, a noted holiday resort on the W. coast, which attracts many visitors in the summer.

Pop. 3000. see ELIZABETH, Šylva, Carmen,

Sylva, Carmen, see ELIZABETH, PAULINE ELIZABETH OTTILIE LOUISE. Sylvester, James Joseph (1814-97), an English mathematician, born in London, educated at Cambridge. He taught at University College, London, in the University of Virginia, in the John Hopkin's University, at Woolvich, and at Oxford, and published wich, and at Oxford, and published numerous memoirs and papers,

Sylvester, Joshua (1563-1618), He seems to have lived wandering life as an unsuccessful tion of any moral or spiritual thing

merchant, and to have died in Holland. His translation of the Divine Weeks and Works of Du Bartas had at one time a great reputation. His Collected Works were published in 1641, and reprinted in the Chertsey Worthics Library, 1878.

Sylvester I., Pope (b. c. 270), the son Rufinus and Ste. Juste. He was ordained priest at the age of thirty. During his occupation of the papal throne the heresy of Arius disturbed the church. He was the first pone to be represented wearing the triple

crown. Sylvester II. was of obscure origin. He was enthroned pope on April 2, 999. He obtained from the emperor on his accession letters attesting the temporal power of the Holy Sec. S. II., or Gerbert, has left many writings and was a man of much learning.

Sylvester III., antipope, was raised to the papal dignity by Ptolemy in place of Pope John, deposed for the licentiousness of his life.

Sylviadæ, see WARBLERS.

Sylviculture, see Arboriculture and Forestry.

colour and soluble in water

2, sp. gr. 1.9). Jacobus (the quantity and quality. A bad S., with sylvius, Jacobus (the Latinised one of the premises implied only, is name of Jacques Dubois), (1478-1555), Latinised a French anatomist, began to lecture on anatomy at the Royal College, Paris, when he was already over fifty years old. His lectures were mere expositions of his master, Galen, and were only rarely enlightened by practical demonstrations from the

human frame. Symbiosis, or Mutualism, an intimate relationship between separate organisms, one of which may have been originally parasitic on the other, but by modification the two have become able to live together and derive mutual benefit from each other's presence. Each lichen is a combination of a fungus and one or more kinds of algae, living in active partnership. S. exists between a fungus and certain rye-grasses, the mycellum being veretatively perpetuated in the seed of the plant and not by spores. Infected found to be more vicorous than un-infected ones. Leguminous plants and nodule bacteria are in symblotic re-lationship, the latter supplying the roots of the plants with nitrogen, and in return receiving carbon and other necessary food elements.

Symbolism, the sign or representa-

significance with which they are in Laforgue, Kahn, Verhaeren, Viéle, vested, or the event of which they are Griffin. As an offshoot Moréas founded the representation, while others, like the Roman school, the material objects of idolatry, are often either in no way apparently tional or arbitrary related to such significance or representation, or such connection as there may be is to be sought in some long forgotten association of ideas, e.g. the tree-trunk which assists a savage to meditate on some divine conception merely because thousands of his ancestors having so regarded such symbol it has become sanctified with a halo of reverence. S. is also specifically applied to the system which invests the forms of Christian ritual, dogma, and the fabric and archidogma, and the churches with a symbolical meaning. Thus in the cucharist the bread and wine are called symbols of the body and blood of Christ. In connection with the subject of baptismal S. it is a highly controversial question whether any worshipper, however spiritually minded, can dispense altogether with separated or not, such separation is never really accomplished, and that some material agent is active even in the most refined and spiritual per-ceptions. In theology generally every sacrament is an outward and visible sign of inward and visible grace. The seven sacraments: baptism, confirmation, the eucharist, penance, holy orders, matrimony, and extreme

by the images or properties of natural nassiens (q.v.). Its main object was or material things; or the assumption in external things of an inner by the logical transcription of the spiritual meaning, e.g. the lion is the symbol of courage, the lamb of meekness or patience. Symbols themselves secrets of the soul by means of are of various kinds, as types, the nigmas, parables, fables, allegories, emblems, hieroglyphies, etc. Some closely approximate to or rather are exponents, Baudelaire, Mallarme, and readily suggestive of the inward significance with which they are invested, or the event of which they are iffilm. As an offshoot Moréas founded

Symbols, a symbol is a conventional or arbitrary sign, by means of which the writing of names in science

is much simplified.

Chemical.—Dalton was the first to introduce a system of chemical symbols. He represented the atoms of substances by means of circles, an atom of one substance being distinguished from that of another by some mark inside this circle. Thus a clear circle O represented an atom of oxygen, o an atom of hydrogen, o one of carbon, \oplus an atom of sulphur, and so on. He thought that water was the combination of one atom of oxygen with one of hydrogen, he therefore represented a molecule of water by OO. His symbols were entirely superseded by those intro-duced by Berselius. The symbol for an atom of an element is usually represented by the first letter of the name of the substance. Thus, carbon minded, can dispense altogether with symbols or material facts, either as C, hydrogen H, oxygen O, etc. In on aid to the realisation and expression of spiritual truths, or as an external stimulus to the mental atti-initial letter, two letters are emtude of devotion. Sir Oliver Lodge as an apologist of orthodoxy maintains that, whether the spiritual and initial letter or letters of the Latin material can in fact be entirely in the spiritual and in the substance. This carbon is substance. Thus, carbon in the substance. The substance. The substance. The substance is carbon in the substance in the substance in the substance is carbon in the substance in the substance is carbon in the substance in the substance in the subs silver (argentum) Ag, and so on. is known that two atoms of hydrogen combine with one of oxygen to form water. Thus H₂O represents a mole-cule of water and conveys the above idea. In a similar manner a molecule of hydrogen is written H₂, because it Roman Catholic church recognises is known to contain two atoms. NH, stands for a molecule of am-monia, and implies that three atoms orders, matrimony, and extreme of hydrogen and one of nitrogen are unction; the Protestant church only two: baptism and communion. stand also for the atomic weight in graded by the orthodox in each H₁ represents two grams of hydrogen, church as symbolical, or a mere and NH₁ conveys the idea that four-means of grace, is disputable. Sir teen grams of nitrogen are combined. church as symbolical, or a mere and NH, conveys the idea that four-means of grace, is disputable. Sir teen grams of nitrogen are combined Oliver Lodge thinks that the general the logical conception of a sacrament is recognised by both the English and the Roman church, and cites the Homilies in support (Man and the Universe).

Symbolist, l'Ecole, a reactionary school which arose against the Par-

represent 22.21 litres of nitrogen, means 5 feet 6 inches by 4 feet 3 hydrogen, and ammonia respectively. Symbols are also employed to express chemical reactions, by means of equations. The symbols of the interacting substances are placed, with a plus sign in between, on the left hand side of the equation. On the right hand side are placed the symbols of the substances formed also with a plus sign in between. The equation

BaCl.+Na.SO.=BaSO.+2NaCl means that a molecule of barium chloride (BaCl₂) combines with a molecule of sodium sulphate (Na.SO.) to give one molecule of barium sulphate (BaSO₄) and two molecules of sodium chloride (NaCl). Or that 208 grams of barium chloride interact with 142 grams of sodium sulphate to give 233 grams of barium sulphate and 117 grams of sodium chloride. If the interacting substances are gases, we have a relation between the volumes employed in addition to the gravitational relation above. H₂+Cl₂=2HCl means tha Thus, that volume (22.24 litres) of hydrogen combines with one volume of chlorine to give two volumes (44.48 litres) of hydrochloric acid gas. In a similar manner interactions between gases and solids or liquids can be expressed either gravitationally or volumetrically, or as a combination of the two.

Arithmetical. + (plus) means addition, positive; - (minus), substraction; + re, positive; -re, negative; + and - stand for positive in magnetism, electricity, or when referring to a direction; =, equality; three strokes (=) means identically equal; x, multiplied by; ÷, divided by; divided by is also expressed thus, a/b, i.e. a divided by b; √, square root; %, cube root; %, nth root, and so on; an means a multiplied by itself

n times; a^n means the nth root of a. $a^{-n} = a^{\overline{n}}, a^{\circ} = 1$; := therefore: := because. The expression a:b::c:dmeans that a is to b as c is to d, or $\frac{a}{b} = \frac{c}{d}$; α , varies as, e.g. $y \propto x$, yb; — the difference of, e.g. x = y, difference of x and y; x = y, opposite Δ , and so on. An angle is ten sq. ems.; c.c., cubic centimetres; often denoted by θ , ϕ , ψ , α , β , etc. em., centimetres; mm., millimetres; log., logarithm; e, the base of the gm. grams. £ s. d., pounds, shillings, and pence. Feet and inches are written and f; thus 5f 6f × 4f 3f gramme-second system; F.P.S. or

inches; ∞, infinity, a quantity greater than any we can name. 0 zero. n! or !n! (factorial n) means n(n-1)(n-2)...1. ${}^{n}C_{r}$, combinations of n things r at a time; ${}^{n}P_{r}$, permutations of n things r at a time; . brackets : I, the algebraic sum of : a, b, c, etc., usually denote constants, and x, y, c. variables.

Geometrical. □, square; □, square inches: \square' , square feet; Length is denoted usually by L or l, area by A or a, volume by V or v, radius by R or r, diameter by D or d, radius of curvature by ρ , angle ABC by ABC or ABC; at, right angles; ats

or I at right angles or perpendicular to; || parallel; | not parallel; |

rectangle; O, circle; ellipse; bola; R.H., rectangular hyperbola;

||m, or ||m, parallelogram; ||piped, parallelopiped. Calculus. f(x), F(x), $\phi(x)$, $\psi(x)$, etc., functions of x; f(x, y), F(x, y), etc., functions of x and y; $f^{-1}(x)$, $F^{-1}(x)$, etc., inverse functions of x and y; D, differentiation; ferentiation with respect to x. $\frac{dy}{dx}$, differentiation of y with respect

 $\frac{dy}{dx^n}$, y differentiated n times with respect to x; δ , increment, thus δx is the increment of x; $\frac{b}{\delta x}$, partial differentiation; \int or D^{-1} integrate. In Newton's fluxional notation \dot{x} means differentiate x with respect to time; \ddot{x} differentiate twice, and so on.

Trigonometrical. P (x, y), the coordinates of point P are x and y. Sin, cos, tan, etc., are abbreviations of the circular functions sine, cosine, tangent, etc. 50° 10' 21' means an angle 50 degrees 40 minutes 21 seconds (see b d TRIGONOMETRIAL A THE STATE OF THE STATE

celeration; M, m, mass; V, v, velocity; a, f, acceleration. V, volume; A, area; W, weight; w, weight of unit mass. K.E. or T, kinetic energy; unit mass. K.E. or T, kinctic energy; V, potential energy; ft. lbs., footpounds in work; lbs. feet, pound-feet in momentum; T, t, time; F, force; T, tension; p, pressure; ω, angular velocity; p, volume density; σ surface density; λ, line density; E, Young's modulus; N, rigidity modulus; n, number of; I, moment of inertia; T.M., twisting moment; B.M. bending moment; O, quantity. B.M., bending moment; Q, quantity; H.P., horse-power.

Physical. t, temperature in degrees; J, Joules' equivalent; F°, C°, degrees Fahrenheit and centigrade respectively.

Electrical. x, y, z, etc., current. C, continuous current in ampères; C, continuous current in amperes; Ce, Ca, external and armature cur-rent; R, resistance in ohms; Ra, Rs, resistance of armature and shunt; ρ, specific resistance; E.M.F., electro-motive force, or simply E, also in volts; I, maximum alternating cur-rent; i, effective alternating current. L. M. coefficients of self and mutual L, M, coefficients of self and mutual inductions; \Box , impedance; ω , ohm; Ω , megohm; K, k, capacity or specific inductive capacity; mfd, microfarad; Q, q, quantity of electricity; z, electrochemical equivalent. 11, cell; 11/11, battery of three cells in series.

F.M., field magnet. inductive resistance: ···-, non-inductive resistance;

LLL' alternating current transformer: condenser, or

- are lamp.

power in watts; WJ, work in

glow lamp;

Pw, power in watts; WJ, work in Joules; G, galvanometer; s, shunt; A, ammeter; V, voltmeter; n, number of turns of wire; —, alternations per second; B.T.U., Board of Trade units; B.Th.U., British thermal units. Magnetic. N, S, north and south poles of a magnet; m, strength of pole; I, distance between poles; M, magnetic moment; H, strength of magnetic field; I, intensity of magnetianticn; B, magnetic induction; K, magnetic susceptibility; \(\mu\), magnetic permeability. M.M.F., magnetic permeability. ncto-motive force.

Syme, James (1799-1870), a Scot-

ft. lbs. sec., foot-pound-second sys-spirit, who nevertheless impressed tem; g, value of gravitational ac-his contemporaries with the driving force of his will and with his exceptional abilities as a teacher. For four years (1829-33) he supervised a hospital of his own in Edinburgh, connected with which was a clinical school, and in 1833 he accepted the chair of clinical surgery in the uni-

Symons

versity of that town. He wrote Principles of Surgery, 1832, etc.
Symington, William (1763-1831), a Scottish inventor, has every title to the claim of having made the first practical steamboat, for the Charlotte Dundas was already working on the Forth and Clyde Canal in 1802. The paddle-wheel was propelled by Watt's rotative engine.

Symmachus, Quintus Aurelius (c. 345-410 A.D.), a Roman statesman, cherished, like Cicero, a deep veneration for the past. The letter which, as prefect of the city (384), he addressed to Valentinian II., urging him to restore the altar of Victory, is still extant.

Symmachus the Samaritan (fl. 200 A.D.) was a native of Samaria, who became an Ebronite Jew. He published a Greek translation of the O.T. -the third in point of time-which now only exists in fragments.

Symmetry, in mathematics, means in agreement, or in a sense, proportional. Consider the two halves into which a diameter cuts a circle. The two semi-circles are symmetrical, because they are proportional about the diameter and could be fitted one on the other if folded along the diameter. Equations can often be written in symmetrical form, in which form they are most easily dealt with.

Symonds, John Addington (1840-93). an English man of letters, spent his life, like R. L. Stevenson, in combating the demon of ill-health, and like Stevenson again was never happy unless working at a fever heat. too, moreover, was obliged to clude the rigours of an English climate, finding a happy refuge in Davos Platz—as he describes so charmingly in Our Life in the Swiss Highlands (1891). His critical biographies of Shelley (1878), Sir Philip Sidney (1886), and Michelangelo (1893) are true literature, and his Autobiography of Benvenuto Cellini (1887) exhibits his admirable gifts as a translator. Besides poems, S. wrote essays on Dante (1872) and the Greek poets (1873-76).

Symons, Arthur (b. 1865), a poet and critic, born in Wales. In 1889 he published a book of verses, Days and Nights, which was favourably reviewed by Walter Pater in the Pall tish surgeon, was a contentious Mall Gazette. His next two volumes of

poetry, Silhouettes and London Nights | occasionally in sonata form. evinced the influence of Verlaine, with whom he had meanwhile formed a friendship; since then Mr. S. has produced many works, notably Aubrey Beardsley, 1897; The Symbolist Movement in Literature, 1899; Cities, 1903; Plays, Acting, and Cities, 1903; Plays, Acting, and Music, 1903; Studies in Prose and Verse, 1904; Cities, 1905; Studies of Italy, 1907; and Knave of Hearts, 1913.

Symons, George James (1838-1900), famous meteorologist, founder of the British rainfall organisation, and the first to keep records of the rainfall of Great Britain. In 1856 he entered the Meteorological Society, and in 1857 he was appointed a reporter to the Registrar General, and later worked under Admiral Fitzroy, who was researching on storm warnings on behalf of the meteorological depart-ment of the Board of Trade. His first volume, British Rainfall, appeared in 1860, and in 1866 he launched out with Symon's Monthly Meteorological Magazine.

Symons, Sir William Penn (1843-99), led the British major-general, Burma column in the Chin-Lushai expedition (1889) and the first divi-sion in the Tirah expedition (1898). During the South African War he was mortally wounded during a gallant assault, under his direction,

of Talana Hill near Dundee.

Sympathetic Inks, see INK. Sympathetic Nerves, see NERVOUS

SYSTEM.

Sympathy (from Gk. σύν together, $\pi a \theta o s$, feeling), or Fellow-feeling, in a human is an emotional state caused by intense consciousness of the sufferings, feelings, hopes, and pleasures of another living creature. Organic S. is primarily physical and inherited, showing itself in a violent liking for some particular thing (thus, being the opposite of antipathy) or in an innate understanding, as e.g. of wild animals. Reflective S., primitive originating in though emotion caused at the sight or thought of another's condition, critical and may be developed for the good of society. See Emotions, and FEELINGS.

Symphony, a composition, usually of four movements, in sonata-form, for orchestra. The term 'sintonia' originally signified the prelude to an opera, but as a definite and distinct form the instrumental sonata or S. was established by Haydn and per-fected by Mozart and Beethoven. The movements are usually (1) an allegro in sonata-form; (2) a slow movement; (3) a scherzo, or with trough. See Anticlinal. Beethoven, a minuet, and (4) an Syncope (from the Gk. συγκοπή, a allegro or presto, in rondo-form, or cutting short, from κόπτω, I cut), a

order is observed in classical Ss., but modern works are often entirely different; in some cases, c.g. Liszt and Elgar, movements follow without a break, as in Beethoven's C-minor (last two movements). The greatest symphonists since Beethoven, including those who use the symphonicpoem form, are Schubert, Brahms, Tchaikovsky. Liszt, R. Strauss. Dvorak, Parry, Stanford, and Elgar. See Sonata.

Symphoricarpus, a genus of Caprifoliacem indigenous to N. America. Of the eight species the best known is S. racemosus, the snowberry, frequently cultivated as a shrubbery-

nlant.

Symposium (Gk. συμπόσιοι), a Greek drinking party. The title was used by both Plate and Xenophon for books describing the conversations of Plate, and hence the term has changed its meaning to that of a conference or general discussion.

Symptoms, certain changes in the bodily processes of a patient which serve to indicate the nature and location of a disease. An accidental symptom is one which is not con-

nected with the disease.

Synagogue (Gk. συναγωγή, an assembly), a word used to denote either sembly), a word used to denote either the congregation, or the place itself in which Jewish communities meet together for public worship. The origin of the S. is obscure. From the earliest times, however, some special local assemblies seem to have been needed in addition to the Tabernacle and Temple services. Something of the same kind is indicated in Is. vili. 16. The true development of the S. however, dates from the days of Ezra's reformations, from which time every Jew was expected to be acquainted with the law. The conduct of the S. was in the hands of ten lay rulers.' The chief services were on the Sabbath morning.

Synallaxis, a genus of passeriform birds in the family Dendrocolaptide, contains several species which have peculiarities in the construction of their nests. Their cry is harsh and the birds are usually found in pairs.

Syncellus, George (d. c. 800), a Greek compiler, was a monk who served Tarasius, patriarch of Con-stantinople as 'syncellus,' or chaplain. His Chronography, which deals with the world's history from Adam Diocletian, is a plagiarism of Eusebius' Chronicon.

Syncline, the trough-like part of a geological fold, the strata sloping inwards towards the centre of the

against a common enemy), in philosophy and theology, the tendency to unite in one the chief points of various different systems having some common basis. The term is specially used to denote a scheme advocated in the 17th century by Calixtus for the reunion of Roman Catholics and the various Protestant bodies.

Syndic (Gk. σύν, together, and δικα, justice), in ancient Greece, an advocate in a court of justice. In the Roman digest it means an attorney or agent for a universitus or corporate body: in which sense Gaius uses it as a synonym for Actor. In the middle ages Syndicus meant the agent or factor appointed by corporations to manage their common affairs, though more especially to the S. was the Almost all the

had their Ss. Cambridge University, the duty being to regulate fees.

Syndicalism. After Sir Wm. Har-urt's declaration, 'We are all court's declaration, Socialists now,' it became apparent socialists how, it became apparent that the terrifying properties of the word 'Socialism' were wearing thin. Hence recourse to a new 'bogie-word,' and to-day (1913) the word 'Syndicalism' is used to frighten timid souls. The body of doctrine represented by this word is at present ill-defined, and is hardly indicated by S. is somewhat akin to the Industrial Unionist movement in the U.S.A., but is best suited to European continental conditions, and flourishes most in the Romance countries. Georges Sorel, the Marx of this movement, is a Frenchman, and among other prominent exponents of Syn-dicalist theories are the Italians, Arturo Labriola and Enrico Leone. Let us first examine its constructive side.

All the modern social theorising

grammatical term denoting the claims of different candidates to the elision or non-pronunciation of a letter in the middle of a word, as, for These are: (1) the present owners, example, of the 'e' in 'heav'n,' and of the 'v' in 'e'er.' See Fainting state; and (3) the workers in the infor another meaning of the term.

Syncretism (Gk. συγκρημομός, union tative of the first is Capitalism; of the second Socialism; of the third the second, Socialism; of the third, Syndicalism. Joint ownership is possible between any two of these groups. and for the different social theories based on these partnerships the reader is referred to the article Socialism. But S. sans phrase stands for the unfettered ownership and control of industry by the workers' trade unions linked in a loose national federation. The mines would belong to the miners, the railways to the railway workers, and so forth, and each union would make its contract with others. Thus the miners' union would arrange to supply the coal necessary to work the railways in re-turn for which the railway union would carry the coal got by the miners. A council of representatives porations to manage their common miners. A council of representatives affairs, though more especially to from all the unions would administer represent them in law courts. On the national concerns, but for the rest continent, S. meant a government laiser faire would be the ruling idea. A central parliament, with representatives in different countries, or a kind of tatives from geographical districts as magistrate intrusted with the affairs of a city or community. In Concern scheme of things. It will thus be seen the Syndicalist of a city or community. a sort of group Anarchism

id orthodox (or Marxian) have not hesitated to detheir chief nounce S. as sheer anarchism. Syndicalist leaders retort that S. is a true child of Marx, and that if the great father of modern Socialism were alive to-day he would denounce as reactionary the present Socialist

leaders.

S. made its first initial appearance in Britain towards the end of the first decade of this century, but the general public was first made aware of its existence by the series of widespread strikes in the year 1911. In 1912 a it. The word is derived from the French Syndicat. In France, where tions of English Syndicalists for S. was born, a syndicate does not mean, as in English, a trading comment, as in English, a trading composed to their officers when called upon to fire in cases of riots arising men. The best English equivalent of the term is revolutionary trade-union-anti-militarist nature of Syndicalist nature of Syndicalists. number of prosecutions and convictions of English Syndicalists for propaganda (see HERVÉ, G.). Messrs. Tom Mann, Guy Bowman, and Gaylord Wilshire are leading English Syndicalists. The first international Syndicalist Conference was held in London in the autumn of 1913.

Mrs Sydney . Means con-books and periodicals. The following may be mentioned here: Dr. Louis Levine, The Labour Movement in France, a Study in Revolutionary Syndicalism starts with an examination of the (Columbia University Series); A. D.

Lewis, Syndicalism and the General God.

Strike (Unwin); W. Sombart, Socialing to Synchology of Ptolemais in the Libyan Pentapolis.

Syndicalism and Labour is a general | adverse criticism, and Messrs P. Snowden and J. R. MacDonald have written criticisms from the Socialist

point of view. Syndicate, a partnership formed to carry out some one special financial or industrial project or enterprise, as, for example, to purchase the Crystal Palace, to erect a monument, or to float a company. In the absence of express stipulation to the contrary, such a partnership legally continues only up to the termination of the adventure which is the subject of the partnership. Similarly in the case of joint stock companies under the Companies Consolidation Act, 1908, if the main object of a company is gone, the company must be wound up. This may be illustrated by the up. This may be musuraved of the Amalgamated Syndicate (1897); the company was formed to erect stands and let out seats for the Diamond Jubilee procession, memorandum of association association usual comprehensive tained the powers, among which were: (1) to carry on all manner of promotion business; and (2) to act as house agents. After the Jubilee, the S. having incurred a heavy loss, the directors proposed to carry on business under the above specified powers, but the court held that the substratum having gone, the company must be wound up; and the enumeration of powers were read by the court not as a succession of objects different not as a succession of objects that as general powers merely providing for the execution by the company of matters which are only incidental to its main with the so-called 'Celtic Reobjects. In connection with stock companies it need hardl said that the formation of a S. is

customary mode of setting abou flotation of a company; in which a Deirdre, Tinker's Il edding, Riders sense it is further to be noted that a S. is generally itself an incorporated Company, which having acquired a company, which having acquired a not Poems and Translations. See certain undertaking, sells it to another critical lives by F. Bickley and company at a profit, taking either cash or shares or both in exchange, the directors and promoters of the preliminary company or S., as a rule, becoming large shareholders directors of the new company.

was a native of Cyrene in Africa. Alexandria he attended the mathematical and philosophical lectures of the great Hypatia. A convert to Christianity, he was loth to accept his bishopric, and was actually allowed by the compliant Theophilus to keep the wife he dearly loved. His 156 letters are of intense interest, and there is much to divert the scholar in his treatises in Praise of Baldness, on Dreams, and on Self-Discipline.

Synge, John Millington (1871-1909), a dramatist, born at Rathfarnham, co. Galway; educated at Trinity College, Dublin, 1888-92. He studied music in Germany (1893) and literary criticism in Paris (1895), where he



JOHN MILLINGTON SYNGE

His writings in 8 vols.)

eslern World. no of the Glen.

P. P. Howe.

Synonym (Lat. synonymum; σύν, together; διομα, name), the term applied to a word which has the same or almost the same meaning as another word, or to a pair of words Synergism (Gk. συνερία, co-operation), in theology, the doctrine that in the work of salvation the will of mence. There is often, however, a man must co-operate with the will of slight difference, which sometimes becomes greater, so that the terms eventually lose their synonymous force.

Synovial Membrane, a membrane covering the articular extremities of bones and the inner surface of ligaments entering into the formation of It secretes a clear lubricata joint. ing fluid with an alkaline reaction. Synovitis is inflammation of synovial membrane; it may lead to

ankylosis or stiffening of the joint. Syntipas. This is the title of a collection of stories, written in Greek, and bearing the name of Michael Andreopulus, but the collection is evidently translated from an Oriental work. Many of the stories of S. are found almost verbatim in an Arabic manuscript of the Arabian Nights, in the British Museum, but the whole style of the stories points evidently to an Indian origin.

Syntonin, the acid albumen into which myosin is converted by the action of dilute acids. It is also called 'muscle fibrin,' being akin to fibrin, an important constituent of muscular

tissue.

Syphax, a Numidian warrior, was king of the Massylians, but before 204 n.c. had defeated Masinissa and made himself master of the Massylian kingdom. At first a dangerous enemy to the Carthaginians, he finally threw in his fortunes with their leader, Hasdrubal—influenced, it is said, by Hasdrubal's daughter. Sophonisba, whom he married. Eventually he died a Roman captive after Scipio had destroyed his camp and troops by fire near Utica (203 B.C.). Syphilis, a chronic infectious disease

generally contracted during sexual intercourse. It is contagious until the tertiary stage is reached. The origin of this disease is rather uncertain, but we have grounds for believing that it was introduced into Europe by Columbus's sailors who had contracted the 'Neapolitan disease' and 'the 'French disease.' At the end of the 15th century it spread through Europe in the form of a great epidemic. It is characterised by various structural lesions, the most distinctive of which are the chance, the mucous patch, and the gumma. A parasite (Spirochæta pallida), present in the lesions, is accepted as the cause. Being generally a coylel matter the Being generally a sexual matter, the most common situation for its appearmay affect any abraded surface on lence is also grossly exaggerated, the body that the germ may come As a cure for S. mercury and iod into contact with. An abraded sur-

upon which chancres are commonly found. The earliest manifestations of acquired S. is the chancre or primary sore which appears between two and six weeks after the disease is first contracted. It usually takes the form of a reddish-brown pimple with an ulcerated summit and an indurated base which, when pressed between the finger and thumb, has a cartilaginous feeling. Following the appearance of the chancre the nearest lymphatic glands swell and become hard. The mucous patch is formed upon mucous membranes or in situations where two skin surfaces are constantly in contact. It is a slightly elevated patch usually covered by a thin whitish membrane. The gumma is a rounded tumour of varying size. Its usual Its usual situations are the periosteum of flat bones, the membranes of the brain, the testicle, liver, and spleen. It contains a gummy material and is generally soft to the touch.

There are three stages in the course of the disease: (1) the primary (primary S.), distinguished by the presence of the chancre; (2) the secondary (secondary S.), by the by the (2) the mucous patch, sore throat, and swelling of the glands; and (3) the tertiary (lerliary S.), by the gumma and skin lesions. A period of six to nine weeks intervenes between the appearance of primary S. and that of secondary S. No definite time can be fixed for tertiary S., as it is extremely variable. S. other than that acquired through sexual connection is known as non-venereal or S. insontium (S. of the innocents. Forms of non-venereal S. may be congenital, hereditary, economica (i.e. that form contracted by using contaminated materials, e.g. a towel formerly used by an affected person, and also by casual contact with a contact of the contact of with a syphilitic), or technica (i.e. that form acquired by those attending on syphilitics, e.g. doctors, nurses, and midwives).

The The general idea regarding S. seems to be that it is an incurable disease and usually proving fatal. In this connection Hutchison states:

'It would be absurd to speak of syphilis as in the main a bugbear, but the impression derived from my own experience as to its curability and remote results incline me to suspect that the gross exaggerations prevalent respecting it cause more misery than is produced by the disease itself. This most common situation for its appear-eminent authority further suggests ance is the genital organs, but it that the popular estimate of its preva-

As a cure for S. mercury and iodides have been used, but these are likely face, however, is not essential, as the to be superseded by a marvellous virus can easily penetrate the deli-chemical compound discovered by cate, soft, and moist mucous surfaces | Ehrlich with the assistance of S.

Hata (of Tokio) and at one time foolish delay, consults a medical man. known as Ehrlich-Hata. This is dioxy-Very soon the young man imagines diamino-arseno-benzoldi-hydrochlor-himself cured, fails to visit his adviser, ide, registered as Salvarsan, and commonly called '606.' The use of salvarsan has been attended with startling and almost miraculous effects. Ehrlich writes concerning the specific action of '606': 'With a sufficient dose spirochetes disappear in 24 to 48 hours; if longer, it is due to the dose being insufficient or

being insufficiently absorbed. A royal commission, under the chairmanship of Lord Sydenham has been appointed quite recently (Nov. 1913) to investigate the whole of the subject of the hidden plague—as it is called in the terms of reference, which The appointare extremely wide. ment of this commission has met with world-wide approval and interest, and Professor Ehrlich himself has offered his services in connection with it. The importance of this subject being thoroughly investigated can be gauged from the fact that at the meetings of the Royal Society of Medicine in 1912 it was stated authoritatively that there were 40,000 cases at least in London only, and 130,000 in the United Kingdom. As has been pointed out, it is absolutely curable. but the grave danger consists in the fact that it is contagious, and can therefore—as has been shown in the course of this article-be acquired by perfectly innocent people, such as wives, students, dentists, and children, and may thus even be passed on banned from open discussion; easy to paint in glowing colours the terrors resulting from such conduct, but once it is recognised that by placing oneself absolutely under the control and direction of any responsible and well experienced medical man until he discharges the victim as cured, a large number of these terrors will disappear, and in time, it is confidently asserted by some authorities that the plague itself may be exterminated (at any rate, in non-tropical countries). It must be noted, however, minated (at any rate, in non-tropical general moral tone of future general countries). It must be noted, however, that the doctor's instructions must be therefore taken as law, otherwise, as can be taken as law, otherwise, as can be shown by the following example given in a prominent English monthly periodical, the effects may be disast frous. A young man, it is assumed becomes affected, and after the usual processing the provided of the property of the property of the provided of the prov

and ceases the course of treatment; although he has been told that the remedy takes at least a year. Naturally in the course of a few months the secondary symptoms appear and again he takes up the course, this time more seriously; but, as before, he again rejects the advice given him. Later, he marries, and again has to see his doctor. This time he has tertiary symptoms. In the meantime a child has been born and in a month or so shows the hereditary taint. wife, until the child has been born. has shown no signs of contagion; but and the importance of this cannot be too much insisted upon-she acquires S. from the feetus during parturition (unless, and this is very rare, she has been placed under treatment months before). This is quite sufficient to show the necessity for rigorous treatment of the scourge, changed attitude of mind towards it. and for more openness on the part of its victims. It will also show, as has been pointed out by Sir Jonathan Hutchison and powerfully reiterated by Civis, that the danger of the scourge in European countries is not the disease itself, but the general test the disease itself, but the neglect of the disease.'

It must not be assumed, however, that one can act with impunity and transgress the ordinary moral code of to-day as one is led by desire. Although Hutchison has formulated the

law of syphilitic transbanned from open discussion; take of spinatal transbecause of the manner in whit
is mainly acquired, and is always that of such diseases as gout and
associated with, illegitimate sexual scrofula, and although it follows
intercourse, persons afflicted endeavour to conceal the fact; hence cured may marry and have perfectly
the name hidden plague. It would be healthy offspring, yet it is still, and
easy to paint in glowing colours the
always will be, not equally applicable to male and female. For an affected woman retains the germ much longer than a man, and it is extremely diffi-cult to state with an absolute degree of accuracy when, in such cases, a cure has been effected. Candour on this question, and serious and intelligent study, will undoubtedly lessen its danger; and, more important still, may result in the uplifting of the general moral tone of future generason, Syphilis; Lambkin, Syphilis; M'Intosh and Fildes, Syphilis from the Modern Standpoint; Martindale, Salvarsan ('606'); McDonagh, Salvarsan in Syphilis; System of Syphilis (6 vols.); Ehrlich and Wechselmann, Schwarzer Salva Government,

Salvarsan. See also GONORRHEA.
Syra, or Syros (ancient Σύρος), an important island of the Greek Cyclades in the Ægean Sea, having an area of 55 sq. m. Since the loss of its forests it has become noted for its bare and rocky soil. In 1800 the inhabitants numbered some 1000, but after the settlement of Greek refugees the island rapidly became populous. In spite of the competition of Pireus the chief port, Hermupolis, which is the seat of a Roman Catholic bishop as well as of the government, is still a flourishing commercial entrepôt of the Levant, exporting sponges, emery stone, lemons, and valonia. Pop. 31,939.

Syracuse: 1. (It., Siracusa), a fortified city and seaport, the cap. of the prov. of Syracuse, Sicily, is situated on the peninsula (formerly an island) of Ortygia, 81 m. S.W. of Messina. It has a cathedral, and other ecclesiastical edifices, the ruins of Greek and Roman temples, catacombs, aqueducts, an amphitheatre, and quarries which were formerly used as prisons. There are also the remains of a Greek theatre and a museum of antiquities. There is trade in salt, wine, chemicals, pottery, olive oil, asphalt, almonds, oranges, and lemons. Pop. 40,589. In ancient times it was the wealthiest and most populous city in Sicily. was founded in 734 B.C., one year after the foundation of Naxos by a colony of Corinthians and other Dorians, led by Archiasthe Corinthian. At the time of its greatest prosperity S. had two harbours. The Great Harbour, still called Porto Maggiore, is a splendid bay about 5 m. in circumference, formed by the island of Ortygia and the promontory known as Plem-myrium. The Small Harbour, also called Laccius, lying between Orty-gia and Achradina was capacious enough to receive a large fleet of ships There were several stone quarries (lautumiæ) in S., which are irequently mentioned by ancient writers, and in which the unfortunate Athenian prisoners were confined. The government of S. was frequently originally an aristocracy and afterwards a democracy, until Gelon made himself tyrant or sovereign of Syracuse in 485 g.c. Under his rule and that of his brother Hieron, S. was raised to an unexampled degree of wealth and prosperity. Hieron died

provoked a revolt among his subjects, which led to his deposition and the establishment of a democratical form of government. The next important event in the history of S. was the siege of the city by the Athenians, which ended in the total destruction of the great Athenian armament in 413. The democracy continued to exist in S. until 406, when the elder Dionysius made himself tyrant of the city. After a long and prosperous reign he was succeeded in 367 by his son, the younger Dionysius, who was finally expelled by Timoleon in 343. A reexpelled by Timoleon in 343. A republican form of government was again established; but it did not last long, and in 317 S. fell under the sway of Agathocles. This tyrant died in 289, and the city being distracted by factions, the Syracusans voluntarily conferred the supreme power on Hieron II., with the title of king in 270. Hieron cultivated friendly relations with the Romans: but on his tions with the Romans; but on his death in 216, at the advanced age of ninety-two, his grandson, Hierony-mus, who succeeded him, espoused the cause of the Carthaginians. A Roman army under Marcellus was sent against S., and after a siege of two years, during which Archimedes assisted his fellow-citizens by the construction of various engines of war, the city was taken by Marcellus in 212. From this time S. became a town of the Box archimedes with the statement of the Box archimedes. town of the Roman province of Sicily. S. declined under the dominion of the Romans, but owing to its beautiful edifices, and the fact of its being the centre of intellectual culture, it always held a prominent position. In 878 A.D. the Saracens captured the city, and looted it of its treasures, afterwards burning it to the ground. Although rebuilt the city never recovered its former importance. It suffered severely from earthquake in 1170 and 1693. Consult Freeman 1170 and 1693. Consult Freeman History of Sicily. 2. A city and port of New York State, U.S.A., cap. of Onondaga co., is built on the S. shore of the lake of Onondaga, 147 m. W. of Albany. It is the seat of a university, and is a commercial centre of great importance. The chief manufactures include machine-shop products, soda sah and kindred products, farm tools. furniture, heer motors. farm tools, furniture, beer, motors, machinery, and woollen goods; minor industries are connected with chemicals, salt, wine, and pottery. Here is a U.S.A. weather bureau attached to the university; it was opened in 1902. It was formerly a great salt producing centre. Pop. (1910) 137,249.

Syr-Daria, a prov. of Russian Turkestan, Asia, lying N. of Bokhara and

wealth and prosperity. Hieron died kestan, Asia, lying N. of Bokhara and in 467 and was succeeded by his samarcand, and bounded W. by the brother Thrasybulas; but the rapa-Aral Sea, and E. by E. Turkestan. city and cruelty of the latter soon Area 194,947 sq. m. Pop. 1,858,200.

More than half of its area is desert or | Palmyra, endeavoured to make S. the steppe-land, inadequately irrigated seat of empire. The chief river is the Syr-Daria ors were sorely (Jaxartes or Sihun) which rises in the Tian Shan Range, being known by various names in its upper course. The Amu Daria (or Cxus) flows along part of the S. frontier. The Kizil-Kum and Kara-Kum deserts lie in the E. of the prov., but in the fertile region farther S. wheat, barley, in the first was not fruits are rice, millet, oats, rye, and fruits are raised. Cotton is also grown to a small extent. The minerals found include silver, porphyry, copper, lead, coal, salt, and turquoise. Weaving, saddlery, and metal-working are carried on. The prov. was steadily Russianised between 1845 and 1867. The chief towns are Tashkent, Ko-kand, and Namangan.

Syria, a country of Turkey-in-Asia, lying between the Levant on the E. and the Arabian Desert and the Euphrates on the W., and extending N. and S, from Mt. Taurus to the S. frontier of Palestine. It was the Aram (or 'the highlands') of the ancients, and in a narrower sense only implied the region N. and N.E. of Palestine. Its surface is mainly plateau, gently dipping from the Libanus and Anti-Libanus ranges (6000 - 10,000 towards the Arabian Desert. Area 3,675,100, Pop. 114,530 sq. m. mainly Mohammedans, Druses, and The chief river is the Jordan, which rises on the W. side of Mt. Hermon and flows S. to the Dead Sea. The chief ports are Beyrout, Acre, Tyre, and Tripoli. The vine is exand fruit and

live oil, lemons tobacco, and cereals are exported: The inhabitants of S. were of Semitic origin, of the same stock as the Hebrews. At the beginning of the Hebrew mon-archy S. was divided into a number of petty kingdoms, which were generally at war with Israel. As the great Assyrian kingdom waxed, S. waned, Damascus was destroyed by Tiglath Pileser, king of Assyria, who conquered all S. about the middle of the 8th century B.C. After having successively been a part of the Assyrian, Babylonian, Persian, and Macedonian empires, S. once more became powerful under the rule of Seleucus Nicator (312 B.C.) with Antioch for its capital. Its strength was further increased by Antiochus the Great; it was then that Palestine became a Syrian province. In 66 B.C. (after the destruction of the kingdom of S. by Tigranes), S. was added by Pompey to the possessions of the republic, and became a Roman province; as such it is mentioned in the Much later Zenobia, Queen of

The Roman emperors were sorely put to it to defend S. from Persian incursions. When the When the Roman empire was divided, S. was included in the Byzantine empire until 636, when it was conquered by the Saracens, who held it during the troublous times of the Crusades. S. later fell into the hands of the Egyptians, was overrun by the Mongol hordes in 1290, and its destruction Turks, who

1516, emained a Turkish province. See Baodekar, Palestine and Syria. See also PALESTINE, DEAD SEA, Jordan, LEBANON,

PALMYRA, etc.
Syriac Language and Literature. to the f which

branch in the Bible in several places, and passages of Syriac occur here and there. In Dan. ii. 4 1 spake to th

in Syriack, follows. Another long passage of Syriac occurs in Ezra iv. 7 ff. Passages in Syriac, or in which the lan-guage is referred to, are Matt. xxvii. 46; Mark v. 41, vii. 34; 1 Cor. xvi. 22, etc. It was spoken for over one thousand years over a very wide region of Central Asia, and was the language of a large number of peoples. The term Syriac is sometimes used in a narrower sense to designate the dialect of Edessa, but this is not usual. The Syriac alphabet is founded upon the Hebrew, with alterations. The grammar of Syriac is in general fairly simple. The syntax of Syriac resembles in general characteristics that of Hebrew. As regards phonology, Syriac tends to shorten Hebrew long vowels and to substitute dentals for sibilants. It was at one time thought that Syriac was a derivative of Hebrew. Singirli show '

about 700 I language has ence from Heart inscriptions, it has well marked inscriptions, it has well marked inscriptions. It seems to Syriac characteristics. have occupied much the same place in business and diplomatic affairs as French to-day. This is shown by such passages as 2 Kings xviii. 26, and by the nature of the inscriptions which have been found in early Syrlac. Syriac attained importance as a literary language, however, in the early centuries of the Christian cra. One of the earliest translations of the

Bible, the Peshitta (simple), was made in Syriae in the 2nd century A.D., and Edessa rose to importance the Peshitia (simple),

as a Christian centre. Shortly afterwards, the traditional commentaries Duval, La Littérature Syriaque.
on the O.T. (the Targums), were put Syringa, a genus of Oleaceæ, coninto writing. The language of the tains ten species which grow in into writing. The language of the Peshitta and the Targums differs in some important respects, and that of some important respects, and that of the Biblical passages has differences from both. By the 4th century, Christian writers had adopted Syriac cas a literary language. The Syrian Church was split up into four sects —Malkites, Maronites, Nestorians, and Jacobites—all of which had their service-books and psalters. The greatest of the early Syrian fathers was St. Aphrem (Ephraim) (d. 373). He was a voluminous writer of commentaries, homilies, and poeticaltreatises of various sorts. In the 5th caltreatises of various sorts. In the 5th century begins the vernacular Syriac historical literature. It was about this time that the pure Syriac language began to be corrupted by the importation of Greek loan words, while Hebraisms also began to creep in Isaac the Great of Antioch flourished in the 5th century. Like Ephraim he wrote a very large number of works, all of a religious tendency, and also like him wrote much verse. St. all of a religious tendency, and also like him wrote much verse. St. Simeon Stylites (d. 459) is remembered chiefly on account of Tennyson's poem. Meanwhile, the Syrian Church was torn with internal conditions. Church was torn with internal conflicts, which are reflected in the writings of the 6th and 7th centuries. Jacob of Serugh, Joshua Stylites, Sergius of Ras'ain (1. 6th century), John of Asia (b. c. 505), and Jacob of Edessa (b. c. 640), the Monophysite, are important names of the great age of Syriae literature (see Wright, op. cit. infra). But with the great schism in the 7th century between the Nestorians and the Jacobites, a separation took place, which implied a severance of tradition in the literature which emanated from the two sects. The writings of Denys of Talmahar and Thomas of Maraghah, however, deserve mention here. But however, deserve mention here. But the literature had reached its zenith just prior to the split between the sects, and it never regained its former glory. It practically came to an end with the conquest of Aramea by the Arabs, though an exception must be made in the case of Bar-Hebræus (ft. 13th century), whose life was largely spent in trying to revive the Syriac language. Syriac is still used as a living language, though in a much corrupted form, by small groups of villagers in Mesopotamia. It is used, more or less in its classical form, as an ecclesiastical language by the Nestorian Church, but the priests who was it a constant contact. who use it are often completely ignorant of the meaning of the formulas they utter. See Crichton's Noldeke's Syriac Grammar; W. Wright,

tains ten species which grow in Europe and Asia. The best known of these is S. vulgaris, the common lilac, often grown in Britain. The name of S. is also given to several shrubbery plants in the saxifragaceous genus Philadelphus.

Syringe (from the Gk. σῦριγέ, a pipe), a hydraulic instrument used in medicine for injecting liquids into the body and for washing out wounds, etc. Its principle is the same as that of the pump (q.v.), and the essential features are a pointed nozzle and a glass, metal, or india-rubber tube attached thereto and fitted with an air-tight piston. The fluid is projected from the nozzle in a jet which is large in an abdominal as compared with a hypodermic S.

Syrinx, an Arcadian nymph, be-loved of Pan, who seized her when she was changed into a reed and fashioned out of her a pipe, such as the shep-herds were ever afterwards wont to

play. Syrlin, Jörg (fl. 1450), a German woodcarver, is called 'the Elder' to distinguish him from his son, who followed the same profession. The splendid stalls of Ulm Cathedral are his finest work (1469-74), but he also embellished the fountain which stands in the market place of that town.

Syrtis, or Syrtes, the classical name of two dangerous gulfs, the Syrtis Major and the Syrtis Minor, in the Mediterranean, oif the shores of N.

Syrup (from Arabic sharab, drink) is the same word as 'shrub.' It indicates primar''r a struck. dicates primar"-of sugar such tilled water a agent, is used

'Golden syrup' is the uncrystallisable fluid, which is a by-product in the re-fining of crystallised sugar.

Syssitia, The, were the meals which the men and youths in Sparta and in Crete ate together and in public. The meat was doled out in rations, but barley bread and wine and afterwards olives, figs, and cheese

could be had in plenty.

Syzigy (from Gk. συξυγία, a yoking together), an astronomical term, denoting either of the two positions of the moon when it appears to be in a

line with the sun.

Syran, a tn., on the r. b. of the Volga, in the gov. of and 89 m. S. of Simbirsk, in Central Russia. It is noted for its tanneries, leather goods, and flour mills, and also as the centre of a market-gardening district. Pop. Szabadka (Ger. Maria-Theresiopel),

the Hungarian government at Frank-Hungary, cap. of the comitat of Confurt in 1848. Thence he was sent to grad, is situated at the junction of the London. His best-known work is his Theiss with the Maros, about 100 m.

Pop. 28,000.

Sze-ch'uen, rivers '), the (218,480 sq. m. in area) of China, Pop. 31,593. lying in the W. The highlands in the W. rise to 19,000 ft. and the N. is also mountainous, but over the E. Mozsgo by and centre stretches a broad and Zrinyi heroic fertile plateau, where cereals, sugar, hold against the Turks. tea, rice, oranges, rhubarb, and than 6000. tes, rice, oranges, randary, and tobacco grow in plenty. The province is well watered by the Yang-tse-kiang in the S. and elsewhere by its large tributaries, the Fu-sung-ho, Min thread industries; it rades also in kiang, and Kialing-kiang, which all timber and tobacco. Pop. 26,000.

a tn., 108 m. S.S.E. of Budapest, in Ries in the N.W. There is considerables-Bodrog, Hungary, on the fertile plain between the Danube and the Theiss. It commands a prosperous trade in cereals, cattle, wool, skins, and fruit. Pop. 94,610.

Szalay, Ledislas (1813-64), a Hungarian historian, born at Budapest, studied philosophy at the University of Pesth. About 1837 he began his attempt to popularise modern ideas of social reform in his own journal, Themis. He was the representative of the Hungarian government at Frank-Hungary, cap. of the comitat of Cson-

History of Hungary, 1850-53.

S.E. of Budapest. It is an extremely Szarvas, a horse-breeding centre well-built town, with many handon the Körös, 40 m. E. of Keeskemet, some and substantial edifices, having in Békés, Hungary. Pop. 26,000. been entirely rebuilt since 1879, when Szatmar-Nemethy, a cathedral city, the city was swept away by a disaswith commerce in potteries, linen, trous inundation, which involved and wine, on the Szamos, 68 m. by the loss of over 2000 lives. Pop. rail E.N.E. of Debreczen, in Hungary. 118,328.

or Szechwan ('four comitat of Csongrad, stands on a trib.
e largest province of the Theiss, 31 m. N.E. of Szegedin.

Szigetvar, a tn. in the co. of Somogy, Hungary, 17 m. S.S.W. of Mozsgo by rail. In 1566 Count Zrinyi heroically defended its strong-Pop. less

came to be written T, its final form. According to the 'first sound shift, which took place in the Primitive period, mediæ became tenues aspirates, and astenues. pirates mediæ. (These changes were formulated into a definite law by Grimm in 1822). See Grimbi's LAW. Taale, Count Eduard Franz Joseph

von (1833-95), an Austrian statesman of Irish descent, born at Vienna. From 1863 till 1867 he was governor of Salzburg; in the latter year he entered the Austrian cabinet as minister of the interior. He was premier from Oct. 1869 to Jan. 1870, when he was again minister of the interior for a time. After being governor of the Tyrol, he became premier in 1879, and retained the office until his resignation in 1893. T. had great charm of manner and tact, and these served him in good stead in uniting the various nationalities of the empire.

angas prov., Luzon, Philippine Is., 50 m. S. of Manila. Pop. 18,000.

Taal, the name given to the patois in the government schools.

Tabaco, a pueblo in Albay prov., Tabaca, 15 m. N. of Albay.

22,000.

Tabarca, or Thabargah, a tn., on a fine bay, Tunis, N. Africa, 55 m. E. of Bona, has sardine fisheries. Pop. 2000. Tabarca Island faces

the town.

Tabard (Fr. labarre, from Low Lat. tabardum), a military garment in house. general use in the latter half of the 15th century, which fitted closely to the body, was open at the sides, had wide sleeves or flaps reaching to the 15 m. N.E. of Almeria, Spain. Pop. elbow, and displayed the armorial 8000.

Tabernas de Valldigna, a com. of front. About the middle of the 15th Spain. 22 m. S. by E. of Valmaria. front. About the middle of the 16th Spain, 22 m. S. by E. of Valencia. century the T. ceased to be used ex. Pop. 8000. century the T. ceased to be used ex-Pop. 80 cept by the officers of arms, who still Tabes continue to wear Ts. embroidered ATAXIA. with the arms of the sovereign.

T, the twentieth letter of the theologian and historian, born at alphabet, is a voiceless dental explosive. The carliest form of the travels, finally settled as teacher of letter was X, and the Phoenician name for it was fau, which means the author of the Annals (Tarikh ur cross' or 'sign.' In early Greek MSS. we find it written T, which history of the world. He is also the came to be written T its final term the author of the Annals (Tarikh ur Rusul wal Mulūk), the first Arabic history of the world. He is also the compiler of the most famous commentary on Alkoran.

Tabariyeh (ancient Tiberias), a tn.of Palestine, on the lake of Gennesaret or Tiberias, 27 m. E.S.E. of Acre, was the Roman cap. of Galilee, and the scene of a defeat of Crusaders by Saladin (1187). Near the town are

hot springs. Tabasco, a southern state of Mexico, bounded on the N. by the Gulf of Mexico, on the E. by Campeachy and Guatemala, on the S. by Chiapas, and on the W. by Vera Cruz. The surface is flat and the soil fertile, yielding cacao, coffee, tobacco, rice, and fruit. The chief towns are San Juan Bautista (cap.) and Frontera (port). Area 10,075 sq. m. Pop. 183,708.

Tabasheer, or Tabashir, a yellowish white deposit of silica in the joints of some of the bamboos, used in the

E. Indies as a tonic.
Tabernacle, The, a portable tent-Taal, a pueblo and seaport, Bat-like structure set up by the Israelites in the wilderness for the worship of Yahweh and carried with them in their journeys. Various terms are used for this tabernacle, and it is spoken by Dutch settlers in South used for this tabernacle, and it is Africa. It is a degenerate form of important to distinguish between Dutch. Dutch is now being taught the various descriptions of it given in the separate strata of the Hexa-teuch. Exodus xxxiii. 7-11 gives Luzon, Philippine Is., on the Gulf of the earliest reference (E), and this passage compares in a striking manner with the elaborate description given by P (Exodus xxv., etc.). See article in Temple Dictionary of the Bible, 1910.

Tabernaemontana, \mathbf{a} genus shrubs and trees (order Apocynaceæ), some of which are grown in the stove-T. utilis, the Hya-hya of Demerara, yields a thick sweet milk-

like fluid.

Tabernas, a com. in the prov. and

Dorsalis, see LOCOMOTOR

Tabes Mesenterica, a tuberculous Tabari Abu Ja'far Mohammed ibn disease of the mesenteric glands, Jarir at Tabari (838-923), an Arabian lymphatic glands of the mesentery, a

intestine with the posterior abdominat The disease usually occurs in children, and is characterised by progressive wasting, while the abdomen may become much enlarged through the glands being filled with masses of caseous tubercular matter. Surgical treatment and attention to hygienic

conditions may result in a cure.
Tablat, see St. Gall.
Tablatures, systems of notation used during the 15th to 16th centuries for instrumental music. No staff, as used in vocal music, was employed; but the letter-names of tones were ranged horizontally and divided by vertical lines into bars, after the style of Tonic Sol-fa, the signs of duration being written above. Both lute T. and organ T. were used, the latter for all keyboard music.

Tableaux Vivants (living pictures), are representations by living people of scenes from fiction, mythology, history, etc., often with appropriate background, accessories, costume, etc.

Table Bay, an inlet of the Atlantic in the S.W. coast of the Cape of Good Hope, affords a safe anchorage for the largest ships.

Table-land, see PLATEAU.

Table - Mountain, Tafelberg or (3540 ft.), a mountain of the Cape of Good Hope, overlooking Cape-town and Table Bay. The level top gives it the appearance of a table, and it is often covered with a dense white cloud called The Tablecloth.

Tablet, The, the leading English oman Catholic Journal, was founded by Frederick Lucas in 1840. Mr. John Snead Cox is the present

editor (1913).

Tabley, Baron de. scc DE TABLEY. Taboo, Tabu, or Tapu, as it is most rightly spelt, is a native land-custom whereby certain persons and things are cut off from tribal use and intercourse. sometimes as an honour, sometimes as a disgrace, and sometimes for utilitarian purposes. It is prevalent among the Maoris. A chief being tapu, his person, goods, and any article of his are sacred from the touch of his inferiors. Any one who touches a dead body is tapu, as were those who hoed potato fields during the hoeing time. So many places and people were tapu, by a series of complicated rules, that the Maoris themselves could not always remember. A great deal of the trouble that the early settlers experienced was caused by their unconscious violation of the tapu. Thus the Boyd massacre in 1809, when 66 out of 70 whites were treacherously killed, was due to a member of a trading ship's crew, who happened to be a young chief, being flogged. Similarly the

fold of the peritoneum connecting the | chief who saved the other four was slain with most of his clan, for his violation of the tapu. This tapu system was fairly widespread, for it is common knowledge that the Jews had a rigid system whereby certain things were tapu, as can be ascertained from a perusal of the pentateuch. See J. G. Frazer, The Golden Bough.

Tabor: 1. A tn. of Bohemia, on the Luschnitz. 65 m. S. of Prague. It was founded by and long formed a stronghold of the Hussites (q.v.). There are manufactures of buttons, beer, and cigars. Pop. 11,926. 2. (Arabic Jebel-et-Tor), a mountain in Galilee (1843 ft.), 7 m. E. of Nazareth. It is the traditional scene of the Transfiguration.

Tabor (Arabic lambūr), a small drum played with one stick, usually in combination with a 'gaboulet' or file, and often by the same player.

Tabora, a tn. in the centre of Unyamwezi, German East Africa, 210 m. E. of Ujiji (Lako Tanganyika). It is a centre of the ivory trade. Pop. 35,000.

Taborites, sec Hussites, War of. Tabriz, a city of Persia, cap. of Azerbaijan prov., stands on a small river running into Lake Urumiah, 320 m. W.N.W. of Teheran. An ancient city, with an extensive trade, it was nearly destroyed by an earth-quake in 1721. Pop. 200,000.

Tacahout, one of the many sources

of gallic acid (q.v.),

Tacamahaca, a resinous exudation which occurs on the buds of various species of poplar and is used as a constituent of healing ointments. The name is also applied to the resins obtained from plants of the genus Calophyllum.

Tacca, a genus of perennial plants rder Taccaceæ) with tuberous roots which are rich in starch. fecula is extracted from some of the species, notably T. pinnalifida, and exported from the Malay Peninsula as a substitute for arrowroot. Some species are grown in the stovehouse.

bo: shec.

In 1849 he became bishop-coadjutor of St. Boniface (Winnipeg), in 1851 bishop of Arouth in partibus, in 1853 bishop of St. Boniface, and in 1871 archbishop of Manitoba.

Tacheometry, scc Surveying and

LEVELLING.

Ta-chien-lu, or Ta-tsien-lu, a tn. of China, in the prov. of Szechuen, 120 m. W.S.W. of Chingtu-fu. Tachira, a state of Venezuela, on

the W. frontier, and bounded on the N. by Zulia and on the E. by The cap. is San Cristobal. Mérida.

and there are silver, copper, and coal mines. Pop. 78,000.

Tachometer, an instrument for measuring directly the angular velocity of a rotating shaft. It registers the number of revolutions per minute. It resembles a Watt's governor, but is fixed with its spindle horizontal and driven by the revolving shaft. In small instruments, the spindle is pointed and is pressed firmly into the end of the shaft. In the larger instruments a belt and pulley arrangement is employed. Owing to the rotation, the weights have a tendency to fly off tangentially, this tendency being resisted by a spring which thus actuates a needle which moves round a dial indicating the revolutions per minute. In the larger instruments where more exact results are required, a speed counter is employed, the revolutions being counted in this case by the action of a train of wheels.

Tachylite, the term used to cover the glassy representatives of basalts and pyroxene andesites. It occurs as a thin crust on some lava flows and to windward.

Publius or Gaius Cornelius T. was born either at Rome or Terni, of a respectable family; studied rhetoric and became an eminent pleader. In 78 he married the daughter of Agricola, governor of Britain. He was questor in 79 and prætor in 88, and in 89 went to Germany, where he remained, probably as a governor, till 93. In 97 he became consult under Nerva, after having been a senator during the reign of terror of Domitian. He was the colleague of the younger Pliny in the prosecution of Marius Priscus in 99, after which little is known of his life. Only a part of his works are extant. These include: 17 yes (76 or *"us* (76 or 77), a : dealing with t ical art: Agricoof his father-in-law; Germania, or De situ, moribus, et populis Germaniæ, a valuable ethnographical work on on Germany, particularly strong in human interest; *Historiæ*, being a history of the empire from Galba to Domitian, in twelve books, of which only four and a half remain; *Annales* (115-117), a history of the empire from Augustus to Nero. His style is reculiarly forceful condensed, and is peculiarly forceful, condensed, and epigrammatic. Among the editions of his works are those by Orelli (1846); and in English, Furneaux, Annales (1895) and Germania (1894); Spooner, mathematics (1645) in that city, and

Sugar, rice, vanilla, coffee, cacao, Historia (1891); Davis, Agricola ctc., are the chief articles of produce, (1892); Peterson, Dialogus (1893); and there are silver, copper, and and the Everyman's Library edition. 2. Marcus Claudius Tacitus (275-276 He became emperor at Rome in September after the murder of Aurelian. His short reign (he died in April) was notable both for improvements at home and victories abroad. Tack, in Scots law, the technical name for (1) a lease whether of land or edifices; (2) any contract under which something is let for hire.

Tack, a rope, wire, etc., which is used to secure the windward clews or corners of the courses to the ship's side, and the windward lower end of a fore-and-aft sail amidships. in all triangular sails and in those four-sided sails where the head is not parallel to the foot, the foremost corner at the foot is called a T. A ship is said to tack when the Ts. are shifted and the yards braced, and the ship's head turned to the wind, so that she shall sail at the same angle to the wind on the other side; thus by alternate Ts. a ship proceeds against the wind in an oblique direction, or 'beats

Tacloban, a seaport and the cap. of the island of Leyte, Philippines, situated on the N.E. coast on San Juanico Strait. It has a trade with Manila, and exports rice, etc. Pop.

12,000. Tacna, or San Pedro de Tacna, a prov., dept., and tn. of Chile. The prov. has an area of 9248 sq. m. The tn. is situated on the R. Tacna, 40 m. N. of Arica by rail, which is its port. T. was ceded to Chile by Peru in 1884, T. was ceded to Chile by Peru in 1884, the cession being for ten years; it is still occupied by Chile, but in 1913 an agreement between Chile and Peru was accepted and treaties signed Pop. of prov. 42,900, of tn. 14,500.

Tacoma (called 'the City of Destiny'), a city and seaport of Washington, U.S.A., and the cap. of Pierce co., at the head of Puget Sound. It has an excellent harbour, and it is one of the principal parts on

and it is one of the principal ports on the Pacific coast. There is an important export trade, lumber, flour, and fish are the chief articles. T. was adopted as the chief western ter-minus of the North Pacific Railway in 1880, when the population was under 1000; in 1910 it was 83,743. Tacoma Mount, see RAINIER.

Taconic Mountains, a range of hills in Vermont, U.S.A., which contains strata of Cambrian age (with Olenellus Thompsoni, etc.) which have been more or less metamorphosed during Silurian time.

Tacquet, Andreas (1612 - 60), a Jesuit mathematician, born at Ant-He became professor of werp.

published many scientific treatises, the chief being: Elementa Geometria plana ac solida, 1655; Arithmetica Theoria, 1655; and Geometriæ Practicæ libri tres, 1659.

Tacsonia, a genus of climbing plants (order Passifloraceæ), with deeply lobed leaves and an elongated tubular calyx, a feature which distinguishes them from the genus Passiflora.

Tactics, see Strategy and Tactics. Tacuarembo, the largest dept. of Uruguay, crossed by 32° S. and 56° W. The cap. is Fructuoso. Area 8074 sq. m. Pop. 48,933.

Tacubaya, a tn. of Mexico in the state and 25 m. S.S.W. of Mexico. It is the seat of the national observa-

tory. Pop. 20,000.

1

Tadcaster (Rom. Calcaria), a market tn. of the W. Riding of York-shire, England, on the R. Wharfe, 9 m W.S.W. of York. Pop. (1911) 3399.

Tadema, sec ALMA-TADEMA. Tadmor, see PALMYRA. Tadoussac, see SAGUENAY. Tadpole, see Frog.

Tacl, a unit of weight used in China, Philippines, Straits Settlements, etc., equal to one Chinese ounce, i.e., 1.33 oz. avoirdupois. The weight

also a money of account, divided into ten mace, the value varies with locality and the fluctuations of bullion, etc. A customs (hackwan) T. is a T. weight in pure silver, equal to 1600 or 1700 copper cash. The value of this varies considerably from 2s. 6d. up-

wards.

Tænia, see Tapeworms.
Tae-Pings, the name given to the
Chinese rebels who made their appearance in 1850, and (see China) deso-lated some of the best cultivated pro-vinces of China. Pekin was taken by the English and French on Oct. 12, Its capture was followed by the ratification of the Treaty of Tientsin, which, granting important privileges to European merchants, made it the direct interest of the English, French, and American governments to re-establish order in China. repulse of the rebels at Shanghai in Aug. 1860, had been followed by several engagements between them and the imperialists, in which they were defeated. Ward, an American, who had taken service under the emperor, had wrought a wonderful im-provement in the imperialist army, and was the chief means of their success. In the beginning of 1862, the T. again advanced on Shanghai, and were twice defeated. In the autumn of the same year Ward was

lish officers were permitted to take service under the Emperor of China, and 'Ward's force,' handed over to an English officer, took the name of Gordon's brigade. The rebels were defeated in upwards of sixteen engagements; and in 1864 almost every important city was taken from The conduct of the imperial them. authorities at Su-chow, where a horrible massacre took place, led to the withdrawal of the English military force; but the rebellion had been effectually checked. Towards the end of 1864, the T., however, still offered an opposition to the Imperialists in Kiang-tsu, all the more formidable in consequence of the preva-lence of brigandage and insurrectionary movements in parts of the empire not affected by the T. rebellion. The last embers of the T. rebellion were trodden out in Feb. 1866, when from 30,000 to 50,000 rebels were routed by the imperial army at Kia-ying-chou in Kwan-tung. See A. Wilson, Gordon's Chinese Campaign, 1868; A. E. Hake, Events of the Tai-ping Rebellion, 1892.

Tafalla, a tn. of Spain in the prov. of Navarre, on the Cidacos, in a wheat, olive, and wine district. There wheat, olive, and wine district. are old towered walls and a citadel.

Pop. 6500.

Taff: 1, A riv. of Wales in Brecknockshire, which rises in Brecknock Beacon and flows S.E. to the Bristol Beacon and nows S.E. to the Bristol Channel, through Glamorganshire. Its valley is entirely occupied with coal and iron industries. Length 40 m. 2. A riv. of Pembrokeshire, Wales, which rises on the E. side of Preselay Mts., in the parish of Llanfyrnoch, and flows S. through Carmarthenshire to Carmarthen Bay. Length 25 m.

Taffeta, or Taffety (Persian tafta), term formerly applied to plain woven silks, which were introduced into England about the 14th century. It is now used of mixtures of silk and

wool.

Taffi, Andrea (1213-94), an Italian artist, born in Florence. He was the first who introduced among his countrymen the art of painting in mosaic, which he had learnt from Apollonius in Venice. T.'s chief performance was a 'Dead Christ' in a chapel at Florence.

Tafilet, or Tafilelt, an oasis on the S.E. of the Atlas Mts., Morocco, noted for its dates. It is a caravan centre, and has been a place of exile for political offenders. Pop. 100,000. Taft, William Howard (b. 1857),

twenty-seventh president of the United States, born at Cincinnati, Ohio. He was the son of the wellof the same year Ward was known diplomatist and cabinet Some time previously, Eng-minister, Alphonso T. He graduated himself both as a scholar and an athlete, and was admitted to Ohio bar in 1880. Two years later he was appointed collector of internal revenue, but only held the post a year, and from 1885-87 he acted as assistant county solicitor for co. Hamilton. He was made judge of the Superior Court for Ohio in 1887, solicitor-general of the United States in 1890, and United States circuit judge in 1892. He first made his mark in the political world as the president of the Philippine Commission (1900-4), being made civil governor of the islands in 1901, a position which he held for three years, when he was appointed secretary for War. He visited the islands again in 1905 as a special completers of the secretary for War. commissioner, and also visited China and Japan. When the Cuban rebellion broke out (1906), he was sent there and established a provisional government. He also paid another visit to Japan and to the Philippine Is. in 1907. He held office as Secretary of War until 1908, when he was nominated as Republican candidate for the presidency. He was elected as Mr. Roosevelt's successor and inaugurated March 4, 1909. He was president for four years, being succeeded by Woodrow Wilson, who was inaugurated on March 4, 1913. Mr. T.'s presidency was noted for the legislation with regard to tariff reform in what is known as the Payne Aldrich Act, and which led to a split in the Republican party; his efforts to deal with the trust question, the troubles relating to conservation, and the labour and Socialist troubles. His presidency throughout was marked by a keen desire for reform; but in 1912 a serious split in the Republican party led to the formation of a New National Progressive party with Mr. Roosevelt at its head, and it was that which eventually defeated Mr. T. at the election in 1912.

Taganrog, a tn. and scaport of Russia in the gov. of Ekaterinoslav. It is situated on a bay of the Sea of Azov, and its industries include fishing, tanning, leather, tobacco, and flour manufs. Pop. 72,000.

Tagbilaran, a pueblo of the island of Bohol, Philippines, and cap. of the Bohol prov. Agriculture and fishing (turtles) are the chief industries. Pop. 10,000.

Taghanic Mountains, sec TACONIC MOUNTAINS.

Tagliacozzo, a tn. and com. of Italy in the prov. of Aquila, 19 m. S.S.W. therefrom. Pop. of tn. 4517,

at Yale University and distinguished | grandson of the Emperor Frederick II., and resulted in the defeat and execution of the latter.

Tagore, Rabindranath, a noted contemporary Indian poet. He visited England (May 1913), and for the Indian Art and Dramatic Society read an English translation (from the Bengali) of one of his own lyrical works, Chitra. He has written plays, songs, and novels, as well as lovepoems, hymns, and other verses. Prose translations of his Gitanjali (Song Offerings), made by the author himself, have been published by Macmillan & Co., Ltd. (1913), and W. B. Yeats has written an introduction to the volume. In Nov. 1913 he was awarded the Nobel Prize for

Literature. Tagus, the chief riv. of the Iberian peninsula, which rises in the Sierra Albarracin, in 40° 38′ N. and 1° 35′ W. It flows W.S.W. in Spain through New Castile and Estremadura, and then takes a more southerly course through Portugal. Above Lisbon it widens out from 3 to 8 m. and empties its waters by two arms into the Bay of Lisbon. The chief tribuare the Alberche, Jarama, etc., and the chief towns on its banks are Toledo in Spain and Lisbon in Portugal. It is navigable to Santarem, but the rapids impede its

utility. Length 566 m.

Tahiti, or Otaheite, the largest of the Society Is. (q.v.), E. Pa-It has an area of 400 sq. m., cific. its appearance being very fertile. though not greatly cultivated. chief products are coffee, sugar-cane, cocca-nuts, bread fruit, yams, bananas, oranges, vanilla, etc.; cattle and pigs are raised, and wool, wax, pearl shells, rum, sugar, copra, etc., are exported. The capital is Papeete, and here the governor resides, who is assisted by a director and a privy council. The trade of Papecte is considerable, amounting to over £220,000

annually. Pop. 11,690.
Taichu, Taihoku, or Taipefu, a tn. of the island of Formosa, Japan, on the R. Tamsui, 13 m. from the port of Tamsui by rail. Pop. 10,000. Taihoku, or Tai-Peh-Fu, the chief

tn. of the island of Formosa, situated to the E. of Tuatutia. Tea, rice, and jute are grown. Pop. 90,000.

Taillandier, Saint-René (1817-79), a French man of letters, the son of a lawyer. He began by writing poetry. and then went to Germany, where he became professor of French literature of com. 9061.

Tagliacozzo, The Battle of, was fought in 1268 between Charles of Anjou and Conrad of Hohenstaufen,

Taillé, in ancient French jurisprudence a tax tallage or subsidy; any imposition levied by the king or any other lord on his subjects. The effect of this impost, as it subsisted in France down to the end of the 18th century, was to discourage agriculture, for it was a tax upon the supposed profits of the farmer, as estimated by the stock upon the farm. The general result was that it was to the interest of the farmer to appear as small as possible, to employ very little in cultivation of the land and nothing in improvement. See Smith, Wealth of Nations, Bk. II.

Taillefer, a Norman bard and war-rior of the 11th century who fought and fell in the battle of Hastings, 1066. Wace, in the Roman de Rou, says that he led the Norman troops, and sang before them of Roland of Charlemagne and of the heroes of Roncevaux. See Freeman's History of the Norman Conquest, 1875-79.

Tailor-tird (Orthotomus sutorius), a small bird, native of India and other parts of Asia, where it feeds on ants and other insects. It is about 6 in. long and of olive-green colour with markings of other tints. Its nest is a dainty structure of leaves joined together with silk, wool, hair, and vegetable fibre, and contains three or four vari-coloured eggs.

Tain, a royal and parl. burgh of Scotland, in the co. of Ross and Cromarty, on Dornoch Firth, 41 m. S.W. of Dornoch. It has a collegiate

church, founded in 1471 and restored in 1871-76. The wife of Robert Bruce sought sanctuary here in 1306. industries are woollen manufactures and distilling. Pop. (1911) 1599.

Tainan (once Taiwan-Iu), a treaty port of Formosa, Japan, on the S.W. coast. It has a large trade. Pop. coast. 50,000.

Taine, Hippolyte Adolphe (1828-93), French historian, logician, critic, born at Vouziers and educated at Collège Bourbon and Ecole Normale. After serving in the provinces under the ministry of Public Education, he returned to Paris (1852) and won his D. ès lettres (1853) with a critique on La Fontaine. The following year his essay on Livy gamed on sophy, with Banour Scenary III with Academy prize; and he decided on ing the Unseen Universe and Paraliterature as a profession. His writing the Unseen Universe and Paraliterature as a profession. His writing the Unseen Universe and Paraliterature as a profession. ing year his essay on Livy gained the Academy prize; and he decided on

ings of this pe Voyage aux Pyr principally of Revues, e.g. the 19th-century

(collected edition 1857). Later works Matter, Dynamics, and Quartermons, were the History of English Literature, Biographical details may be found in

the Young Germany of the beginning of the 19th century. Histoire de la jeune Allemagne and Etudes litteraires or his two principal works.

1863; Philosophu of Art, 1865; The lided in Art, 1867; Critical and Historical Essays, 1858 and 1865; Theory of Intelligence, 1870; Notes on English foreca Economics, 1870; Notes on the 1872. His greatest work, the greatest work, the family France, was land, 1872. Origins of Contemporary France, was left unfinished. In 1863 he became an examiner at St. Cyr, and in 1864 a professor at the Ecole des Beaux-Arts; he received the Legion of Honour in 1866 and the Oxford D.C.L. during his seco See Live: (1908), a

shire's three-volume Life (1902-8).

Tai-ngan, a tn. of Shantung, China, 34 m. S.E. of Tsi-nan-fu. Pop. 46,000. Tai-Peh-Fu, see TAIHOKU.

Tairen, Ta-lien, Dairen, or Talienwan, a bay and port of the Liao tung Peninsula, Manchuria, on its castern side, about 40 m. distant from Port Arthur. It was leased, together with the latter, in 1898.

twenty-fiv naval depôt, barracks, etc., and at this time the important port of Dalny It figured prominently was formed. was formed. It against wars, in naval actions, and in 1901 it fell into the hands of the Japanese. The bay free from ice all through the year.

Tait, Archibald Campbell (1811-82). Archbishop of Canterbury, born in He was educated at Edinburgh. Glasgow University and Balliol College, Oxford. In 1856 he was made bishop of London, and twelve years later was raised to the primacy.
Tait, PeterGuthrie, a Scottish mathe-

matician and physicist, born at Dalkeith in 1831, and educated at Edinburgh Academy, Edinburgh University, and Peterhouse, Cambridge. became senior wrangler and Smith's prizeman in 1852. In In 1854 he was appointed to the professorship of mathematics in Queen's College. Belfast, and removed to Edinburgh in 1860 to occupy the chair of natural philosophy. In mathematics he is well known for his development of the theory of quaternions. His phy. sical researches and experiments were mainly in connection with thermo-dynamics and thermo-electricity. He collaborated with Professor Thomson (Lord Kelvin) in the production of their Treatise on Natural Philo-

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1911.

Tait, William (1793-1864), a Scottish publisher, born in Edinburgh. He published Tail's Edinburgh Magazine (1832-46), an influential Liberal journal which numbered among its contributors De Quincey, J. S. Mill, Cobden, and Miss Martineau. He also published Brown's Philosophy of the Human Mind, Carlyle's German Romance, and Tytler's History of Scotland.

Taiwan, see FORMOSA

Tai-yuan-fu, a walled city Shan-si, China, and cap. of the prov. on the Fuen-ho R., with government

arsenal, etc. Pop. 50,000.

Tajik, or Parsiwan, a Persian-speaking race of Afghanistan, representing the serving class of that country. The Ts. ('strangers') are an athletic race, fine fighters, and skilled farmers. They have assimilated the manners and customs of the Afghans, but are not nomadic. Pop. (est.) 900,000.

Taj Mahal, a famous mausoleum at Agra, built by Shah Jehan about 1629-50 as a tomb for his wife, Mum-

taz Mahal.

Tajurra Bay, an inlet on the African coast and part of the Gulf of Aden. The small town of Tajurra is at its head.

Takaka, a tn. of South Is., New Zealand, 36 m. N.W. of Nelson. Pop. 2000

Takamatsu, the cap. of Kagawa, on the N. coast of Shikoku Is., Japan. It has a noted landscape garden. Pop. 42,578.

Takaoka, a tn. of Toyama, Hondo Is., Japan, 10 m. N.E. of Kanazava. It manufactures dyes and hardware.

Pop. 33,603.

Takasaki, a tn. of Hondo Is., Japan, 63 m. N.W. of Tokio. It manufactures

cotton and silk. Pop. 39,961. Takata, a tn. of Hondo Is., Japan,

42 m. N. of Magano. It manufactures cotton goods. Pop. 25,000.

Takla-makan Desert, a desert of Eastern Turkestan, forming part of the Gobi Desert. It is bounded on the E. by Lob Nor, on the W. to the N.E. by the Tarim, and on the S. by the Kueniun. It extends E. and W. for 600 m., and from N. to S. for about 200 m. It is traversed by the R. Khotan, whose course Mr. Carey, in 1885, followed to its junction with the Tarim.

Takow, a treaty port on the W. coast of Formosa, Japan, 20 m. S. of Tainan; exports rice and sugar.

Pop. 7500.

Taku Forts, a fort. village, Chi-li prov., N. China, near the mouth of the Pei-ho, 30 m. E. of Tien-tsin. It was taken by the French and English fleets in 1858-60 and successfully

the Life by C. G. Knott, published in held against several attacks, and again by the allied troops in June 1900 during the Boxer rising.

Talamancans, a native tribe Central America, who formerly lived

round Costa Rica.

Talavera de la Reina, a tn. of Spain, in the prov. of Toledo, on the Tagus, 75 m. S.E. of Madrid, in a fertile winegrowing district. It possesses very fine squares and streets, and has manufs. of silk and earthenware: Here, in 1809, Wellington gained a victory over the French under Bona-parte. Pop. 11,000.

Talbot (once Back Creek, or Daisy Hill), a township of Talbot co., toria, Australia, 42 m. S.W. of Sandhurst, is the centre of a gold-mining and agricultural district. Pop. 1200.

Talbot, an extinct breed of dogs allied to the bloodhound.

John Talbot, and Charles. SHREWSBURY, EARLS OF.

Talbot. Richard, see TYRCONNEL.

DUKE OF.
Talbot, William Henry Fox (1800-77), born at Laycock Abbey, Educated Harrow shire. at Trinity College, Cambridge, twelfth wrangler. He worked chiefly mathematics and optics and chemical changes of colour. Discovered the calotype process of photography (q.r.) for which he received the medal of the Royal Society, 1842. His photographic discoveries are related in his Pencil of Nature, 1844.

Tale, a hydrous bi-silicate of magnesia, which crystallises in the rhombic system (hardness 1, sp. gr. 2.8). Crystals are rare and the massive form 'steatite' or 'soapstone' is more common. French chalk, not-French chalk, potmore common. stone, and figure-stone are all varieties of T. It is used as a lubricant. for making ornaments, and as fire

stones in furnaces.

Talca, a northern prov. of Chile, with an area of 3739 sq. m. and a pop. of 146,700. Talca, the capital, is an important trade centre. The principal industry is the manuf. of woollen 'ponchos,' which are specially famous for their beautiful colours and durability. Pop. 43,600.

Talcahuano, see Concepcion.

Talchir Beds, in geology, comprise a part of the Gonduana series of S. The T. is distinguished by India. its remarkable conglomerate or boulder beds (of Permian age) which occur S. of the Nerbudda R., and also in the Punjab.

Talegalius, or Brush Turkey, a genus of Australian mound birds, which are brownish-black in colour, and when mature are about the size of a turkey. They form immense mounds of sand

in which their eggs are deposited.

Talent (Lat. talentum; Gk. τάλαντον,

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weight), a unit of weight adopted by pine Is., near Lipata Point, 6 m. S.W. the Greeks from the Babylonians. The same unit, or derivatives of it, became common throughout Syria, Egypt, and the Hellenic colonies. gold and silver were not coined before about 700 B.C., the use of the balance for weighing out precious metals led to the employment of the unit of weight as a unit of value. Hence the term T. persisted as applied to money throughout the E. Mediterranean districts. The T. of scripture may, however, be taken as roughly equivalent to £400 or 1920 dollars. The use of the word to denote intellectual gift is derived from the parable of the Ts.

Tales, if for any reason a sufficient number of jurors do not appear at a trial, the judge can at the request of either party award a tales de cir-cumstantibus of persons present, i.e., 'award a tales de cirjoin to the jury any one he chooses. This practically never occurs, for the full complement of a special jury would always be made up from the common jury panel, and of a common jury by taking some common juror

jury by taking some common juror in waiting from another court.

Talé-Sap, or Tonlé-Sap (literally, inland lake), a lake of Indo-China, situated partly in the N.W. of Cambodia and partly in Siam. During the summer monsoon the lake has an area of 800 sq. m. and about 50 ft, deep, and is fed by a branch of the Mekong R., but in the dry season its area measures barely 100 sq. m. with area measures barely 100 sq. m. with

a depth of 4 or 5 ft.
Talfourd, Sir Thomas Noon (1795-1854), an English judge and author, born at Reading. His writings incounder from, 1835, a tragedy produced by Macready; The Athenian Captive, 1837; The Castilian, 1853; Letters of Charles Lamb, 1837; and Final Memorials of Charles Lamb, 1849-50. Ta-lien, see Tarren.

Talienwan, see TAIREN. Taliesin, a late 6th-century British bard, to whom is attributed the collection of poems known as The Book of Tallesin, printed in Skene's Four Ancient Books of Wales (1868). The poems are, however, of later date than the 6th century, and T. is held by some to be a purely mythological personage. Consult Stephens' Lucrature of the Kymry, 1849.

Tali-fu, or Tali, a city in the prov. of Tun-nan, China, on the shore of Lake Erh-hai and near Mt. Tsangshan (6670 ft.), 165 m. W.N.W. of Tun-nan city. It was captured by the Mongols in 1250. On its surrender by the Mohammedan rebels in 1873. the population was almost exterminated by the Chinese. Pop. (esti-mated) 25,000.

Talisay, a pueblo of Cebu, Philip

of Cebu. Pop. 14,000.

Talisman, a charm engraved with suitable figures at some special time when the conjunction of the stars is propitious, which has the faculty of preserving its wearer from disease, etc.

Talking Machines, instruments which record and reproduce sounds. The name is also applied to instruments which imitate sounds, e.g., speaking dolls. The instruments which record and reproduce sounds may be divided into two classes. The first class consists of instruments having cylindrical records, e.g., the phonograph and graphophone. The phonograph and graphophone. phonograph consists of a stretched membrane with a style at its centre. In the original Edison phonograph, invented in 1877, a cylindrical drum was wrapped in a sheet of tin foil. The style, which had a blunt point, rested on the tin foil. The person operating spoke into a cone-shaped mouthpiece, which focussed vibrations on to the membrane. The membrane thus set into vibration causes the style to indent the foil to varying depths according to the vibra-tion. During this operation the drum is made to revolve with a uniform velocity. The drum is then brought back to its original position and the style allowed to press against it so as to be always at the bottom of the in-dentation. The drum is then turned at the same rate as before, the membrane thus being made to execute the vibrations made on the foil, and thus give out the sound. Tainter and give out the sound. Bell improved on this instrument by substituting a cylinder made of wax The mouthinstead of the tin foil. piece is closed by a glass disc placed in front of the cylinder. A short lever is attached to the disc and on its other end a small sapphire cutting tool is fixed, being weighted so as to press against the cylinder. The cylinder is against the cylinder. The cylinder is then made to revolve by means of regulated clockwork mechanism, at the same time travelling forward along its The sounds are spoken into the mouthpiece ar indentation of In the wax. second disc of lever, on which is fixed a blunt sapphire point, and the cylinder is made In this instruto revolve as before. ment the original sounds are much better preserved than in the original Edison machine. The disc variety was introduced by Berliner, the engraving made by the stylus due to

the vibrations being made on a disc

instrument is worked similarly to the phonograph. The great difference

between the cylinder and disc instru-

which revolves on a turntable.

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cylinder instrument the stylus is made to vibrate in the direction of its length and so the engraving consists of an indentation of varying depths. In the disc the stylus vibrates sideways and so a wavy groove of uniform depth is cut in the disc. The record made as above described is called a master record. These are moulded and copies are made for commercial purposes. Copies of disc records are made by stamping them on For commercial purposes the disc. the cylinder machine is always used. It has been used for many years in the House of Representatives. gation has taken place as to whether the reproduction of works by these instruments is an infringement of copyright. The French Court of Appeal has decided that this is so, but no decision has been given by the British courts.

Talladega, a tn., cap. of Talladega co., Alabama, U.S.A., 85 m. N.N.E. of Montgomery. Pop. (1910) 5854.

Tallage, a burdensome tax of the Anglo-Norman and Plantagenet periods, imposed on the royal towns, boroughs, and demesne lands, and levied by a poll tax assessed at onesixth of movables. By the statute de tallagio non concedendo, 1297 (an unconfirmed draft of the Confirmatio Carlarum, which latter document makes no mention of T.), it was provided that no T. should be taken without the consent of the commons. Notwithstanding the strict legality of imposition, the levy was strenuously resisted until Parliament abolished the tax altogether in 1340.

Tallaght, a par. and vil. in the co. and 6 m. S.W. of Dublin, Ireland. Pop. (par.) 3348.

Tallahassee, a city, co. seat of Leon co., and cap. of Florida, U.S.A., 26 m. N. of the Gulf of Mexico; has cotton factories. Pop. (1910) 5018.

Talla Water, a small riv. of Scotland in the S. of Peeblesshire. Its source is in the N.W. of Loch Skene, and it flows in a N.W. direction for about 6‡ m. when it joins the R. Tweed, near Tweedsmuir Church.

Tallemant des Réaux, Gédéon (1619-92), a French author, born at La Rochelle. After having travelled in Italy, and taken his degree in civil and canon law, he was in command of the forces in Brittany, but he soon gave his time to literary labours. His chief works are Historiettes and Edipe, a tragedy.

Talleyrand-Périgord, Charles Maurice de (1754-1838), was born at Paris. The effects of a fall when about a year old rendered him lame for life, and he was early destined for the church. He was sent to the Collège d'Har-

ments lies in the engraving. In the court, and thence to the seminary of St. Sulpice and to the Sorbonne. 1780 he was appointed general agent of the clergy of France. In 1788 he was appointed bishop of Autun. As bishop of Autun he was a member of the Etats Généraux convoked in 1789. He was charged with the important task of preparing the upon national education, report which was read to the Assembly in Sept. 1791. The basis of the system advocated in this report was the secularisation of instruction. All parties agreed that he was the only man whose talents fitted him for the delicate mission to England. He was despatched in January 1792 to attempt to commence negotiations, but he was unsuccessful. After the accession of the Gironde party to office. the attempt to ensure at least neutrality on the part of England was renewed. Chauvelin was sent to England as nominal, and along with him T. as real ambassador. T. was at Paris when the events of Aug. 10 put an end to the monarchy. He fled to England, but the English government, after some time, ordered him to leave the country, and he was obliged to seek refuge in America. In 1797 M. de T. was appointed foreign minis-ter under the Directory. He attached himself to the growing power of Bonaparte. The arrangement of the Concordat with the pope was accomplished by T., while the treaty of Luneville, the treaty of Amiens, and the convention of Lyons all bear the impress of the peculiar views of M. de T. T., in 1807, resigned the port-folio of foreign affairs and accepted the nominal dignity of vice-grand-elector of the empire. In 1809 the ex-minister was so unreserved his condemnation of the Spanish expedition that Napoleon deprived him of the office of chamberlain. When Paris capitulated, the emperor Alexander took up his residence in the house of the Prince of Benevento. M. de T. now exerted the influence he possessed over Alexander to obtain the combination of constitutional with the recognition of cy. Louis XVIII. saved apforms legitimacy. Louis XVIII. saved appearances by insisting upon being allowed to grant the charter spontaneously. T. was sent to the congress of Vienna, in Sept. 1814, where he obtained much more favourable terms for France than she would otherwise have had. M. de T. dictated the proclamation of Cambray. The constitutional monarchy, object of his earlier wishes, was now definitely established. In his note of Sept. 21, 1815, he protested, as prime minister, against the new which the allies intended to impose

dictation of his powerful allies; and M. de T. resigned office two months before the conclusion of the treaty. After the revolution of 1830 M. de T. was appointed ambassador to the court of Great Britain, 1830; and he held the appointment till 1835. During these four years M. de T. concluded the quadruple alliance of England, France, Spain, and Porture of the court of the gal, for the purpose of re-establishing the peace of the peninsula.

Tallien, Jean Lambert (1769-1820). a French revolutionist, born in Paris. He was employed successively in a lawyer's and a printer's office, and in 1791 made himself famous as the author of the Jacobin sheet, L'Ami des Citoyens, journal fraternel, pla-carded twice weekly on the walls of Paris. He subsequently became secretary to the Commune Insurrec-tionelle, representative of Seine-et-Oise in the Convention, and member of the Committee of General Security. In these various capacities he took part in the September massacres, the execution of Louis XVI., and the overthrow of the Girondists. T. became president of the Convention (1794), accompanied Napoleon to Egypt (1798), and was captured on his return by an English cruiser. For a time the English Whigs made a hero of him, but he returned to Paris in 1802 and was sent as consul to Alicante.

Tallis, Thomas (c. 1515-85), an English church-music composer, was organist at Waltham Abbey until 1540, and for the next twenty-seven years gentleman of the Chapel Royal, besides being with his pupil, Byrd, joint-organist there. In 1575 master and pupil were granted the monopoly of music-publishing for twenty-one years. The second prayer book of Edward VI., issued in 1552, created the demand for new church music, which T. was one of the chief to supply.

Tallow is composed chiefly of tristearin and tripalmiten, the glycerol esters of stearic and palmitic acids. It is obtained from beef and mutton suet by steaming under pressure in iron cylinders. The membrane or tissue is left and the T. or fat solidifies on cooling to a whitish stiff grease on cooling to a whitish stiff grease which is odourless when fresh, but which on exposure to air acquires a disagreeable smell. T. is used as a lubricant and in the preparation of soap. See SOAP, STEARIN, etc.

Tallow, a market tn. of Waterford, Ireland, on the R. Bride, 5 m. S.W. of Lismoner, her woulder means.

Lismore; has woollen manufs. Pop. (1911) 1400.

Tallow Tree (Stillingia sebifera), a

upon France. His argument was Chinese tree which bears yellow fruitless. Louis XVIII, bowed to the flowers followed by small fruits, the seeds of which yield a wax used by the Chinese for making candles. The wood of the tree is very hard and is used in printing. Another tree (Pentadesma butyracea) bears large red flowers followed by edible berries.

A thick yellow greasy juice exudes from the tree when cut. Tally (Fr. tailler, to cut), primarily a piece of wood on which notches are cut to represent numbers or amounts. Formerly it was customary among traders before the use of writing, to have two such sticks, one kept by the buyer and one by the seller, notched or scored with the amount of goods sold or the money due; and till comparatively late times small publicans and milk vendors kept their accounts in this fashion. The origin of exchequer bills is to be traced to the tallies which served the old Norman exchequer department for receipts and simple records of matters of account; and in times of financial stress exchequer tallies constituted accounts either of loans or sums for which that department held itself responsible. An exchequer T. was a squared piece of wood, on the sides of which the 'writer of the tallies' notched the amount lent, the name of the payer and the date; the T. was then cleft longitudinally into two parts in such a way that each part contained one half of each notch, one part being kept in the exchequer and the other issued to the lender, so that when the strength of the transfer of the strength of the streng that when the issued part was re-turned to the exchequer (usually in payment of taxes) it could be compared with the original. Hence the modern practice with cheques, which, when returned, should tally with the counterfoil. Clumsy as this contrivance was it was effectual in the prevention of forgery, and exchequer tallies were not finally discontinued till 1834.

Tally System, a system of dealing in London and other large towns which articles are sold on credit to customers, the latter agreeing to pay the stipulated price by certain weekly or monthly instalments. The good furnished are generally of inferior quality and the prices exorbitant. The system is open to great abuses and may often be ruinous to thosechiefly mechanics, workmen, domestic servants-who resort totally

shops.
a and Fran-Fran-lomei mε çai cai 10ma (1787). He founded the Théatre Français in 1789. Talmage, Thomas de Witt (1832-

1902), preacher, born at Bound Brook, New Jersey. He became pastor of a Reformed Church at Belleville, New Jersey (1856), whence he removed to Syracuse (1859), Philadelphia (1862), and Brooklyn (1869). He edited the Christian at Work (1873-76) and other religious periodicals, and wrote many books, including Everyday Religion, 1875; and From Manger to Throne, 1895. His printed sermons

had a very large circulation.
Talmud, The (Aramaic, instruction), a name given to a collection of works dealing with the laws and eremonial regulations of late or Rabbinical Judaism, together with a series of commentaries on these works. From this definition it is seen that the T. falls into two parts, known respec-tively as the Mishnā and the Gěmārā. During the Exile, the Jews were prevented from carrying on the sacerdotal worship of the Temple, and so were unable to carry out the sacrificial law. There sprang up, therefore, schools of men learned in the law, and the observance of the Sabbath and the strict observance of the law took the place of the Temple system. On the return from the Exile, through the energetic action of Exra the scribe and his supporter, Nehemiah, the Priestly Code was firmly established, and henceforth the observance of the law became the highest aim of the devout Jew. But before observance must come study, and hence arose schools which studied and commented on the law with the greatest care. Until about 100 B.C. these commentators are known as Sopherim or scribes. During the first hundred years of our era, however, the commentators are known as Tannaim or The last of these was the Rabbi Jehuda ha-Nasi, and it was he who gathered into a single body all the single pronouncements or Halakoth of his predecessors. Though other collections had undoubtedly been made before, it is this one pre-eminently which receives the title of Mishna. During the next three hundred years we find two schools of Amoraim or debaters, one in Palestine and the other in Babylon. The latter school was the more famous. They occupied themselves in commenting on the Mishna, but their comments have sometimes but the remotest connection with the subject. tion with the subject. Hence the Gemara, or collection of expositions of the Mishna, contains a hetero-geneous mass of legends interspersed with scraps from every department of the learning of the time. This is

an American Presbyterian the Babylonian T. are far more imer, born at Bound Brook, New portant than the Palestinian T. in their influence upon the later history of the Jews. The Palestinian Gemara. which was completed about the end which was completed about the end of the 4th century, is much less complete, many parts being missing. The best edition of the Palestinian T. is that of Protrkow (1898-1902). There is an English trans. by M. L. Rodkinson (10 vols., finished 1906), and a French trans. by Schwab (1878-1906). 90). See also Rodkinson's History of the Talmud (1903), and Strack's Einleitung in den Talmud (3rd ed. 1901) 1901). For a complete account of both works, with a complete bibliography and list of editions, see the Jewish Encyclopædia, vol. xii. (1901-6. 12 vols.).

Talpa europœa, see MoLE.

Talpidæ, a family of fossorial insectivora with fore limbs well adapted for subterranean tunnelling. mole (q.v.) is a typical member.

Taltal, a scaport tn. of Chile, in the prov. of Atacama, with an export trade in nitrate of silver, etc.

7000.

Talus, a name applied to the heap of detritus formed of the weathered and broken fragments falling from cliffs and rock slopes. It is of conical form, the material finding its natural angle of rest, which varies with the

size and shape of the fragments.

Tamalpais, Mount, in Marin co.,
California, U.S.A., overlooks San California, U.S.A., overlooks San Francisco Bay, 5 m. S.W. of San Rafael. Altitude 2606 ft. San

Tamandua, a tn., state of Minas Geraes, Brazil, 160 m. W. of Ouro Preto. Pop. 8000.

Tamaqua, a tn. of Schuylkill co., Pennsylvania, U.S.A., on the Little Schuylkill R., 17 m. E.N.E. of Pottsville; has coal mines. Pop. (1910) 9462.

Tamar, a riv. forming the boundary between the counties of Devon and Cornwall, England, forms the estuary of the Hamoaze at Devonport and flows into Plymouth Sound. Length

Tamarind (Tamarindus indica), a leguminous evergreen tree cultivated in India and other tropical countries for its hard, close-grained, heavy wood. It bears pinnate leaves and racemes of yellow, red-streaked flowers followed by legumes, the pulp of which is preserved in syrup; it is a gentle laxative.

Tamarisk (Tamarix), a genus of shrubs. The common T. (T. gallica) has become naturalised on the S. and E. coasts of Britain where it has been extensively planted to bind and cover especially true of the Babylonian sand-dunes. It is evergreen, and the Gemara. The Babylonian Gemara bright green minute scale-like leaves (completed c. 520) and the T. from and spikes of rose pink blooms are borne on drooping reddish or purple | commercial branches.

Tamata, a gov. station, Papua, British New Guinea, 250 m. N.E. of Samarai, in a gold-mining district.

Tamatave, the most important port of Madagascar, faces the Indian Ocean, 140 m. N.E. of Antananarivo. Goral reefs nearly encircle the har-bour and about one-half of the foreign trade of the island passes the The exports consist chiefly of

animal products. Pop. 8761. Tamaulipas, an Atlantic or Gulf state of Mexico, has an area of 32,128 sq. m. and a pop. of 249,253. Inland the surface is mountainous, dipping towards its lagoon-fringed shore on the Gulf of Mexico. There are large cattle ranches, and cattle and their products are exported.

Victoria.

Tamayo y Baus, Manuel (1829-98), a Spanish dramatist whose parents were both actors. He began to take an interest in playwriting at an early age, and as his dramas were favourably received from the first, he soon resigned a position he held in the government in order to devote him-self to dramatic art. He was a member of the Academy of Madrid. Principal plays are La Locura de Amor, Virginia, La Bola de Nieve, and Els de Agosto.

Tamazula, a tn. of Mexico in the

state of Jalisco, and 24 m. E.S.E. of Ciudad Guzman. Pop. 9000. Tambobong, or Malabon, a pueblo on the island of Luzon, Philippine Is. which forms a northern suburb of Manila. Pop. 21,000.

Tambo Grande, a tn. of Peru, in the dept. of Arequipa, 29 m. E.S.E. of

Islay. Pop. 8000.

Tambour, see EMBROIDERY.

Tambourine, a percussion instrument consisting of a vellum head over a circular wooden frame in which 'jingles,' i.e. small cymbals

which 'jingles,' i.e. small cymbals loosely working on a centre-pin, are inserted. Played by rapping or rubbing with the hand, or by shaking. Tambov: 1. A gov. of Central Russia, bounded on the N. by Vladimir and Nijni -Novgorod, on the E. by Penza and Saratov, on the S. by Voronezh, and on the W. by Orel, Tula, and Ryazan. It covers an area of 25,710 sq. m., and its surface is fertile, comprising wider ralleys and plains, cut by deep valleys and plains, cut by deep ravines, while there is much forest-land in the W. The rivers are the Moksha and the Tsna, tribs, of the Olta, and the Voronezh and Khoper, tribs. of the Don. Coal, iron, lime-stone, gypsum, and clay are found. The crops are wheat, oats, rye, barley, potatoes, etc.; hemp and flax, tobacco stone, gypsum, and clay are found. The deus ex machina of Tammany The crops are wheat, oats, rye, barley, potatoes, etc.; hemp and flax, tobacco and beetroot are grown. The chief man of one of the city volunteer fire

towns are Tambor, Kozlov, Morshansk, etc. Pop. 3,412,900. 2. The cap. of the above gov., stands on the Tsna, and has a great grain trade and cattle mart. Pop. 52,942.

Tamerlane, see Timur Beg. Tamil, a Dravidian lar language, spoken in S. India by over sixteen million people. The area over which it is spoken extends roughly from the city of Madras to the N. of It is closely akin to Malayalam, Kanarese, and Telugu. earliest records of Tamil date from the Sth century A.D. Consult Caldwell, Comparative Grammar of the Dravidian Languages (2nd ed.), 1875: G. U. Pope, First Lessons in Tamil (7th ed.), 1904.

Tamise, a tn. of E. Flanders, Belgium, on the Scheldt, near Ghent, with a lace-making industry and manufs of cottons and woollen goods.

Pop. 13,000.

Tammany Hall and Society. A huge New York party organisation established in 1789 and supported by the large miscellaneous population of more or less illiterate foreign immigrants to, and other less reput-able elements in, New York City, which, by the corrupt manipulation of the alien vote and the most unscrupulous party tactics, gradually secured the complete control of the municipal government of New York. It was established as the Columbian Society, soon after Washington's installation as president, by an Irish-American, William Mooney, for social and charitable purposes. In 1805 it adopted the title of Tammany Society (apparently from the name of an Indian chief, Tammanena). the rapid increase of its membership, twenty-five years after its foundation it espoused politics, and definitely allied itself with the Democratic party of New York; and with the help of the huge heterogeneous mass of Irish, Jewish, Russian, and German immigrants soon acquired (1836) an overwhelming influence in city polltics. Favouring causes of its malign progress were the removal in 1842 of all restrictions on the city suffrage, the transfer to the people of the election of judges, and, generally, the corrupt nature of the new City Charter (1857), which vested all the chief administrative functions in the mayor and city departmental heads, and the power of raising and appro-priating revenue to a joint body of the state legislature and a board of supervisors.

man of the common council of the city. amassed wealth by peculation, and eventually managed to get elected as district member in Congress, where, however, he proved a failure. Having obtained the post of public school commissioner in New York, and got elected to the Board of Supervisors, he became a member of Tammany Hall, and very soon permanent chairman of the general committee. Such social qualities as Tammany Hall then still possessed soon dis-appeared under the régime of Tweed and his satellites—Sweeny, a lawyer of obscure origin; Oakey Hall, an American lawyer who had acted as lobbyist in the state capital, Albany; an auctioneer named Richard Connolly, and later, Albert Cardozo, a Portuguese Jew from the rival Portuguese Jew from the rival Democraticorganisation, Mozart Hall. This latter organisation of the demagogue Fernando Wood, coming over to Tammany Hall on the elevation of Wood to Congress, left Tammany undisputed 'boss' of city politics. Through the machinations of Tammany Hall Cardozo got elected to one of the chief city judgeships, while George Barnard and John M'Cann of the Tweed group were awarded two important posts under him. By the most astonishing frauds of naturalisation and false registration through the Judge Cardozo, the proletarian electorate was increased from 10,000 to about 40,000, with the result that the Tammany ring easily secured the election of its chiefs to all the chief offices of the city and also of the state. The control of municipal funds by the abolition of the Board of Supervisors and the transfer of the powers of that body to the recorder and aldermen, gave the Tammany ring every opportunity to pillage the city treasury by projecting huge municipal schemes at exorbitant cost, making the most dishonest iobbing contracts auditing the accounts of the old Board of Supervisors in such a way as to make it appear that large claims were outstanding against that board, and finally by inviting the contractors for the new county court house to add large sums to their bills, which were then promptly appropriated by Tweed and his accomplices. The city debt increased from \$36,000,000 in 1869, to \$97,000,000 in 1871, and there was next to nothing in the way of municipal

companies. In 1850 he became alder- tion of details, Samuel J. Tilden, chairman of the Democratic party in the state (afterwards governor), conducted a vigorous campaign against the ring, with the result that Cardozo resigned, Tweed was put on his trial and sentenced to twelve years' imprisonment, Hall was tried three times but managed to escape conviction. Connolly fled, and the ring was broken. Its later history is associated mainly with the name of Mr. Richard Croker, one time keeper of a liquor saloon, and a clerk under Tweed. Mr. Croker held no civic office, but as chairman of the Tammany sub-committee, controlled all the city officials, and indeed inspired all the state legislative proposals at Albany. Its present organisation is held together present organisation is held together by about one thousand voting dis-tricts, each under a 'captain' nomi-nated by the Tammany committee, who nurses the voters; while the committee members of the society are annually elected by the different 'assembly districts' in the city boroughs. According to Mr. Bryce, the city mayoralties between 1902 and 1910 have given the city a purer and more efficient administration than it had previously enjoyed, and although the police and police magistrates and certain government departments may still be open to serious criticism, the political horizon of New York is 'bright enough to encourage the hope that the clouds which remain will ultimately pass away.' See Bryce's American Commonwealth; Cambridge Modern History; Tilden's Origin and Fall of the New York Ring.

Tammerfors, a tn. of Finland, in the gov. of Tavastehus, 102 m. N.W. by N. of Helsingfors, with manufactures of cotton, linen, paper, and woollens. Lumbering is also carried Pop. 64,000.

on. Tammuz, or Thammuz. Adonis appears to be the Phœnician personification of the sun, who during part of the year is, as the legend expresses it, with the goddess of the underworld, and during the remainder with the regent of heaven, namely Astarte.

Tamp, to ram packing, such as clay, earth, etc., on top of a charge of powder in a blast-hole drilled in the rock, etc. The word is also used of ramming down road-metal, etc. T. work in civil engineering is applied to a road made smooth by tamping

Tampa, a city of Florida, U.S.A. the co. seat of Hillsboro' co., 240 m. improvements to justify it.

Tammany Hall suffered a severe blow in 1871 at the hands of a disaffected member named O'Brien, ing its large trade in phosphates, who 'gave the show away' to the New York Times. After the publica-

largely manufactured. Pop. (1910) now could remeat 37,782.

Tampico, an important port of Tamaulipas, Mexico, near the mouth of the Panuco on the Mexican Gulf. with large dockage and quayage and an important trade in maize, sugar, fruit, etc. Pop. 24,000.

Tamsul, a fort and treaty port of Formosa, Japan, on the N.W. of the island. It was bombarded by the French in 1884. Pop. 6000.

Tamus (Black Bryony), a genus of perennial climbing plants (order Dioscoracem) with a large black tuber and a slender twining stem bearing numerous heart-shaped leaves and clusters of small green flowers followed by scarlet berries.

Tamworth: 1. A municipal bor. and market tn. of Staffordshire and Warwickshire, England, on the R. Tame, 110 m. N.E. of London. There Tamworth: are paper mills and clothing manufs., in the vicinity large market gardens. Coal and fireclay are worked. There is an old castle surrounded by massive walls. Pop. (1911) 7738. 2. A tn. of New South Wales, Australia. in Inglis co., on the Peel and Cockburn rivers. It is a gold-mining centre, with saw- and flour-mills, coach-building

works, etc. Pop. 6200.
Tan, or Tan Waste, the spent bark from Tapits, formerly, and still to some extent used in gardening for making hotbeds and as a material in which pots are plunged. It decays very slowly and has little fertilising value, though it tends to improve the

mechanical condition of heavy soils. Tana: 1. A riv. of British E. Africa. Its course of 500 m. is very winding. and its current rapid. It rises near Mt. Kenia. The width is from 100 to 200 yds., and its banks are low and frequently flooded. It enters the Indian Ocean in 2° 40' S., about 110 m. N.E. of Mombasa. 2. A riv. of Finmarken, Norway, formed by the junction of the Anarjokka and Karasjokka. Its course is winding and generally N.E., and it enters the Arctic Ocean by Tana Flord. Length

Tanacetum, see TANSY.

Tanager, a name for any bird of the family Tanagridæ, allied to the finches. They are natives of Central America, and nearly all of them have very brilliant number. One America, and nearly very brilliant plumage. O One fastuosa); its plumage has a able metallic lustre; the head is sea-green in colour, the breast is violet, and there is a flame-coloured patch on the lower part of the back.

feeds on fruit and insects, and is sometimes kept in an indoor ariary.
Tanagra, a city of ancient Greece, at the intervention of Bonapar on the Asopus in E. Bœotia, the site, was allowed to escape to France. at the intervention of Bonaparte he

m. S. Here t pear the latter rased its walls to the

ground. Tanais, see Don River.

Tanaland, a maritime prov. of British E. Africa, which is bounded by the Indian Ocean on its E. side. It covers an area of 34,000 sq. m., and it contains the districts of Lamu and Port Durnford. There is a considerable export trade carried on in india-

able export trade carried on in muar-rubber, ivory, shells, horns, Indian corn, millet, etc. Pop. 102,000.

Tanana, a riv. of Alaska, U.S.A., and a trib. of the Yukon. Its source is in the N.W. of St. Elias range, and its direction is generally W.N.W. in the Yukon plateau. It joins the the Yukon plateau. It joins the parent river on its S. bank opposite the town of Tanana. It is navigable

for over 300 m.

Tananarivo, or Antananarivo (' the Thousand Towns '), the cap. of Mada-gascar, in the prov. of Ankova, near the middle of the island. It stands on a hill 7000 ft. above sea-level, and it is a well-built city, with houses on European lines. The town is healthy, and, with its suburbs, has a pop. of 94.813.

Tanauan: 1. A pueblo of Leyte Is., Philippines. Pop. 18,000. 2. A tn. on

Luzon Is., Philippines. Pop. 20,000.
Tancred (1078-1112), the crusader who is the hero of Tasso's Gerusalemme, was the nephew of Robert Guiscard and the cousin, therefore, of Bohemund: he is sometimes represometimes represented as Guiscard's grandson. After taking part in the sieges of Nicrea, Antioch, and Jerusalem, and the battle of Ascalon (1099), he became prince of Tiberias and Galilee, and for three years (1100-1103) acted as regent of Antioch.

Tanda, a tn. of United Provinces, India, in the Faizabad div., near the R. Gogra, 86 m. N.W. of Benares. It is noted for cotton goods. Pop. 20.000.

Tanderagee, a market tn. of Ircland in co. Armagh, situated on the Cusher, 5 m. S.E. of Portadown, with manufs.

In 1798 he went to Paris, America. and in con planned ar were assis

Irishmen (7 vols., Dublin), 1842-46.
Taney, Roger Brooke (1777-1864), American chief justice, born in Calvert co. His ancestors were among the earliest settlers of Maryland, having emigrated in the time of Cromwell, and on his mother's side he was descended from Dr. Roger Mainwaring, Bishop of St. David's in the time of Charles I. He was educated at Dickenson College, Carlisle, Penn.; graduated 1795. Admitted to the bar in 1799, immediately entered political life and enjoyed the distinction of being the then youngest member of the House of Delegates of Maryland. Was soon employed in many of the most important causes in his part of the state, and grappled successfully in intellectual conflict with the foremost advocates of the time. In 1811 he successfully defended General Wilkinson, then commander-in-chief of the U.S. army, on a charge of treason, before the military court at Frederick, arising out of the suspension by the accused of the habeas corpus in 1806. In 1812 T., whose political sympathies had till then been Federalist, then transferred his adherence to the Republican party under Jackson, on account of the Federalist opposition to the war of 1812. In 1816 he was elected to the Maryland Senate, and in 1827 became attorney-general of Maryland, later becoming attorney-general of the U.S., and then chief justice of the Supreme Court of the U.S., which post he held till his death. See also Van Santvoord's Lives of the Chief

Justices, U.S.
Tanfield, a par. and vil. of Durham.
England, on the Team, 12 m. N.W.
of Durham, with coal mines, stone
quarries, brick and tile works. Pop.

(1911) 10,105.

Tanga, a bay and seaport on the E. coast of Africa, 75 m. N. of Zanzibar. It is a port of entry for German E.

Africa. Pop. 5000.
Tangail, a tn. of Bengal, India, in the dist. of Maimansingh, 50 m. N.W.

of Dacca. Pop. 32,000.

Tanganyika, a lake of E. Central Africa, situated between 3° and 9° S. It measures over 400 m. in length, and from 30 to 45 m. in width, with an area of 12,700 sq. m. Numerous small bays indent the shores, and many rivers flow into it. Its only permanent outlet is the Lukuja, which leaves the lake at its W. end to connect with the Congo. Among the principal places on the lake are Ujiji, Kavala, Karema, Pambere, etc. The S. part belongs to Britain, the E. to Germany, and the . to Belgium.

R. R. Madden, The Lives of the United | cident points on the curve. In trigonometry the T. of an angle in a rightangled triangle is the ratio of the side opposite the angle to the adjacent shorter side.

Tangermunde, a tn. of Prussian Saxony, scated on the Elbe at its junction with the Tanger, 26 m. N.W. by W. of Brandenburg. Iron-founding, sugar refining, and shipbuilding are its chief occupations. Pop. 13,898.

Tanghinin, a deadly polson extracted from the kernel of Tanghinia

venenifera.

Tangier, or Tangiers (Lat. Tingis, Arabian Tanja), a scaport of Morocco on a bay of the Strait of Gibraltar, 36 m. S.W. of Gibraltar; is the diplomatic headquarters and the second commercial city of Morocco. The town is surrounded by old walls and dominated by a ruined 'kasbah' (fort). The 'Great Sak' (market-(fort). place) is the end of the Saharan and Sudan caravan routes. The value of the imports—tobacco, cotton, silk, flour, and provisions—in 1911 was £513,076, and of the exports—oxen, eggs, slippers, skins, and fowls— £366,673. T. was taken by the Portu-guese in 1471, and held by England. to whom it came as the dowry of Catherine of Braganza, from 1662-84. By the Treaty of Madrid (Nov. 1912) it became the centre of an international zone of about 140 sq. m. and the northern terminus of the Tangler-Fez railway. Pop. 46,000. Tangle Wrack, or Tangle Seaweed

(Laminaria), a genus of olive-coloured unjointed seaweeds, some species of which, particularly *L. digitala* and *L. saccharina*, are both eaten while

young.

Tanguts, a tribe which inhabits parts of Kansu, in China, and the Kuku-Nor and Khan districts in N.E. Tibet. They are of Mongolian origin and nomadic in character, their only wealth consisting of their flocks.

Tangye, James (1825-1913), born near Redruth, Cornwall. Founded with his brother the firm of Tangye Brothers, machinists, Birmingham, 1885. The firm made rapid strides under the advice of James and patented the hydraulic lifting jack, with which the launch of the Great Eastern was accomplished. vented the T. engine, with overhanging cylinder, and greatly improved many methods of manufacture, de-signing 'jigs' and 'templates.' In 1862 the firm built and used a 'road locomotive,' capable of carrying ten people and attaining a speed of 20 m. per hour. He retired in 1872.

Tanis, or Zoan, an ancient city of Egypt, situated 20 m. N. of Tel-el-Kebir. The Tan or Zoan of the Tangent to a curve is the straight Kebir. The Tan or Zoan of the line which passes through two coin-Bible, it is mentioned there as having

been founded seven years later than abandoned himself to the sensual Hebron; it was probably the resi- pleasures of the court of Lady Venus dence of Joseph. About the reign of Rameses II. T. was an important centre of commerce and was noted for its beauty and the fertility of the surrounding country.

Tanistry, in Ireland, an obsolete tenure of lands and the cause of many a family feud, by which the proprietor had a life estate only, to which he was admitted by election. Theoretically the descent went to the eldest or worthiest of the blood of the deceased life tenant. In practice the strongest succeeded.

Tanjay, or Tanay, a pueblo on the E. coast of Negros, Philippine Is., 15 m. N.W. of Dumaguete. Pop. 12.000.

Tanjore, Tanjur, or Tanjávúr, a tn., cap. of Tanjore dist., Madras, India, 170 m. S.W. of Madras. It has a famous Hindu temple, the old palace of the rajahs, and a dismantled fort. ture of inks. T. is the anhydride of The chief manufs. are carpets, silks, gallic acid, since it is converted into jewels, and metal work. It became British in 1799. Pop. 58,000. district comprising the delta of the Cauvery R. is very fertile. 3700 sq. m. Pop. 2,250,000. Area

Tankersley, a tn. in the W. Riding of Yorkshire, England, 41 m. S. of Barnsley. Pop. (1911) 2400.

Barnsley. Pop. (1911) 2400.

Tanna, or Thana, the chief tn. of the Tanna dist., Bombay Presidency, India, on the E. coast of Salsette Is., 22 m. N.E. of Bombay. It was a place of importance under the Portuguese, and the cathedral was erected by them. It was taken by the British in 1774. Pop. 20,000. The district, including Salsette Is., has an area of 3570 sq. m. Pop. 312,000.

Tannahill, Robert (1774-1810), a Scottish poet. He was educated in Paisley. worked as a silk-weaver

there, and committed suicide by works include: Nvendenmiatore, 1534; drowning. James Hogg, the 'Ettrick Le lagrime di San Pietro, 1539, an Shepherd,' visited him ir Many of his songs rank ve among them being Braes o' and Jessie the Flower o' Dun

Tanner, Thomas (1674-17. antiquary and ecclesiastic, equeated at Oxford; became chancellor of Norwich diocese, 1701; canon of Ely, 1713, and of Christ Church, Oxford, 1724; and bishop of St. Asaph's in 1732. His best known works are: Notitia Monastica, 1695; and Bibliothees Britantico-Hibernica. He constituted additional Chibernica. tributed additions to Gibson's edition of Camden's Britannia.

Tannhauser, a legendary German knight, sometimes identified with a Minnesinger of the 13th century, who roved about the country. The legendary T. was also a wanderer, and finally came to the Venusberg or The and finally came to the Venusberg or Tantallon Castle, a ruin on the N. Hörselberg, near Eisenach, where he coast of Haddingtonshire, Scotland,

(Frau Hulda). Later he repented, was allowed to leave the court, and went to Rome to beg pardon from the pope. Pope Urban said the forgiveness of his sins was as im-possible as for his staff to blossom. and T. returned to the Venusberg, and could not be found when the pope's rod began to sprout in three days. Wagner has treated the story in his well-known opera of this name, which slightly differs from the original legend.

Tannic Acid, or Tannin, Calliao, occurs in gall nuts and all kinds of bark. It is extracted by boiling water and is an almost colourless, amorphous substance readily soluble in water. Its solutions possess a very astringent taste and with ferric chloride give a dark blue solution, and hence tannin is used in the manufacthis acid by boiling with dilute sul-phuric acid. Owing to its property of forming insoluble coloured compounds with many dyes, T. is used largely as a mordant and is also extensively employed in 'tanning' (see LEATHER). In medicine T. is employed in cases of diarrhea, hæmorrhage, etc.

Tanning, see LEATHER—Tanning.
Tansa, a riv. in Thana dist., Bombay, India, whose waters have been enclosed by a dam. Since 1892 Bombay, 60 m. distant, has been supplied with water from this source.

Tansillo, Luigi (1510-68), an Italian poet, born at Venosa, Polenza; in 1535 became one of the bodyguard of Don Pedro de Toledo, viceroy of Naples, and later was appointed capitano di giust'zia at Gaeta.

inze a

com-. . . posite plants with much divided leaves and solitary or corymbose, yellow flower-heads. The only British species is the common T. (T. vulgare), which is often abundant in wasto places. The plant is bitter and aromatic, and has been employed as an anthelmintic. It was formerly used in the preparation of various dishes.

in the preparation of various disnes, notably T. pudding, a complicated mixture of herbs and food stuffs.

Tantah, a tn., cap. of Gharblyeh prov., in the Delta, Egypt, 54 m.

N.N.W. of Cairo; noted for its Mohammedan festivals. Pop. 54,000.

3 m. E. of N. Berwick. It stands on a high precipice fronting the Bass Rock, and was the stronghold of the Angus Douglases, from whom it was taken by the Covenanters in 1639. It was further destroyed by Monek, 1659. Tantalum (Symbol Ta, At. wt. 183),

a rare metal associated with niobium in the mineral 'tantalite' or 'colum-It is white in colour (sp. gr. bite. 16.8) and can be drawn into wire of great tenacity and high fusing point (225° C). It has thus been used in constructing the filaments of electric The pentoxide is obtained when the metal is burned in air. Two oxides, however, are known, viz. TaO, and Ta₂O₄. The latter gives rise to the tantalates corresponding to the nitrates and metaphosphates. characteristic salt is potassium fluotantalate, the potassium salt of hydrotantalate, the potassium sait of hydro-fluotantalic acid (H₂TaF₇), the latter being readily formed by solution of the pentoxide in hydrofluoric acid. The metal has been prepared from this salt by reduction with hydrogen followed by fusion 'in vacuo.' Tantalus, a legendary Greek hero, son of Zeus and Pluto, and king of Sloylus father of Pelons and Niche.

Sipylus, father of Pelops and Niobe. He was admitted to the table of the gods, but abused this privilege and was cast into the lower world, where he stood in water which ebbed away when he stooped to drink it. Above his head hung branches of fruits

which swung out of his reach when-ever he tried to grasp them. Tantalus, or Wood-ibis, a genus of wading birds of the Stork family

(Ciconiidæ).

Tantia Topi (c. 1819-59), the most brilliant of the native leaders in the Indian Mutiny. He was the successor of Nana Sahib, and on him the shame of the Cawnpore massacre chiefly rests.

Tantum Ergo, sce PANGE LINGUA.

Taoism, sec LAO-TSZE.

Taormina (ancient Tauromenium), a tn. and winter resort, Messina prov., Sicily, 30 m. S.W. of Messina; was founded by the Greeks (c. 398 B.C.), and has the ruins of a magnificent

theatre. Pop. 4100.

Tap: 1. The device for allowing liquids to be drawn from containing vessels; simply a plug, spigot, or faucet. Also commonly applied to the cock, by turning which liquids are shut off or their flow regulated in a pipe. Screw-taps are male screws, commonly in their grades for cutting the female screw in a hole previously drilled: the taper, middle, and plug taps are used in succession. A 'blank' of hard steel is accurately turned in the lathe and fluted by their longitudinal grooves; the heads are squared to enable them to be operated in a wrench.

Tapachula, a tn. in the state of Chiapas, Mexico, 102 m. S.S.E. of San Cristobal, is the centre of a coffee-growing district. Pop. 21,689. Tapajoz, a riv. of Brazil, is formed

by the confluence of the Arinos and the Juruena in the state of Matto Grosso, and flows in a N.E. direction for 1100 m. to its junction with the Amazon near Santarem. Navigation

is impeded by waterfalls.

Tapestry (Fr. tapis, a carpet or table-cloth; Lat. tapetum, a carpet), a kind of fabric woven with a needle on canvas in wool or silk, sometimes enriched with gold and silver, used as a covering for the walls of a church or room. The term is sometimes used in a more extended sense to include coverings of furniture or carpets (see Comedy of Errors, act iv. scene 1). The use of the loom for the production of richly ornamented fabrics is derived from the Orient; many tapestries also appear to have been worked by hand. The curtains of the Tabernacle in the O.T. were probably worked in silk and gold. There is evidence to show that T. was much in favour among the Egyptians, and its practice was with the Babylonians connected with the exercise of their religion. The with the exercise of their religion. The Ts. purchased by Nero for 2,000,000 sesterces were of Babylonian origin. The Greeks and Romans were also much addicted to the working of cloths in this way. Homer mentions several Ts., of which the most famous is that worked by Penelope in the Odyssey. During the middle ages Ts. were employed for the decoration of churches, and in the 12th and 13th centuries began to be used for private houses also. The latter use is said to houses also. The latter use is said to have been due to contact with the East in the Crusades. In the 14th century the famous Fleming and French Ts. began to be made, those of Arras becoming very celebrated. Louis XIV. in 1666 helped to establish the 'Hotel Royal des Gobelins,' where the beautiful Gobelin Ts. were made till the end of the 18th century. The Bayeaux Ts. are much earlier, and are said to have been worked by the consort of William I. to commemorate the conquest of England. T. is made to-day in much the same way as from the earliest times. A distinction is made between low-warp work, in which the weaver has the T. before him as on a table, and high-warp work, in which it is suspended as a veil. The warp being so stretched, the design is traced and then worked by hand with a needle. See M. B. Huish, Samplers and Tapestry Embroideries, 1913; H. C. Candle, The Tapestry Book, 1913.

Tapeworm, or Cestode, a class of parasitic flat-worms generally charac-

terised by long flat bodies and the of stationary engines Ts. are used to absence of a digestive system. They operate valves. form two groups, the monozoa or unsegmented cestodes, and the merozoa head, which bears suckers or hooks by which the animal attaches itself to the intestines of its host, a narrow neck, and numerous segments or proglottides, each of which is usually provided with generative organs, so that it is capable of independent existence and of reproduction when detached from the parent animal. The eggs are oval or spherical, and develop in the uterus into an embryo furnished with six hooks. When the embryo is swallowed by the fish or other animal which serves as intermediate host, it develops into a hydatid or bladder-worm (q.v.), containing its scolex invaginated or folded inwards. When the hydatid cyst reaches the final host, the scolex is evaginated, attaches itself to the wall of the intestine, and proceeds to develop and throw off proglottides. The Ts. parasitic in man are Tania saginata, from imperfectly cooked heef, Tania solium, from pork, and Dibothriocephalus latus, from fish. They lead to anemic conditions and intestinal disturbances. In most cases they may be expelled by extract of male fern, taken after the intestines

have been well purged.

Tapiau, a tn. of E. Prussia, on the
R. Pregel, 24 m. S.E. of Königsberg.

Pop. 5985.

Tapioca, see CASSAVA.

Tapir (Tapirus), a genus of un-gulates allied to the rhinoceros, but hill (507 ft.) in co. Meath, Ireland, with a short movable trunk, for front toes, and no horns. The skin hairy and very thick, and the tail rudimentary. They frequent forest and are nocturnal in habit, livin chiefly on vegetable matter, though probably omnivorous. Of the five or six living species, one, the largest, is Malayan, and the rest occur in S. America, where they are often hunted. These are black in colour, but the Malayan species has dirty white hindquarters. Though powerful they are shy and inoffensive and are easily tamed, and their use in suitable countries as beasts of burden has been suggested. The thick hide is, however, of great value.

Taplow, a par. and vil. of Buckingham, England, on the Thames, 1 m. from Maidenhead, and 41 m. from

Windsor. Pop. (1911) 1060.

Tappet, a projecting piece on a re-volving shaft or any other moving piece, so placed as to engage at intervals with a lever controlling some roasted is intermittent action. In certain types aborigines.

Tapping, in surgery, an operation occasionally performed for the puror segmented cestodes, which include pose of drawing off an accumulation the larger number of varieties. A of dropsical fluid. A puncture is segmented T. consists of a scolex or made through the overlying tissues and a small tube is inserted. fluid then releases itself by its own pressure, or may be withdrawn by suction.

Taprobane, see Ceylon.

Tapti, a riv. of W. India, rising at an altitude of 2500 ft., in 20° 6' N., and 78° 21' E. Its length is 440 m., and it flows into the Gulf of Cambay.

Tar is a dark brown or blackish viscous liquid obtained by the destructive distillation of coal, shale, or wood. The principal kind of T. is coal T., and is described under that head. Wood T. is obtained chiefly from firs, pines, and larch trees, and is collected in cavities beneath the heaps or meilers,' in which charcoal is prepared. It is a thick, harsh-smelling liquid which is acid, due to the presence of acetic acid (pyroligneous acid), and contains parafilms, resins, etc. Creosote, paraffin, and pitch are produced from the T. which is used for wood and rope, etc. Wood T. is used medicinally in the preparation of ointments for skin diseases. About 20 per cent. of the products of the distillation of coal in coke ovens are liquid and go to make up a kind of T. very closely resembling coal T. Blast furnace T. yields phenols, hydrocarbons, and paraffin wax. Peat and lignite also form T. on destructive

Tara: 1. The name of an isolated

overthrown here. In 1843 one Daniel O'Connell's mass meetings in support of legislative union repeal was held here. 2. A tn. of Siberla, Russia, in the gov. of Tobolsk, 244 m. S.E. of the city of that name, on the It has an export trade in Irtysh. furs, and cattle-breeding is carried on. Pop. 8000.

Tara, or Taro, the tuberous roots shrubby plants in the Pacific

of the plant are

eaten like spinach. Tara Fern (Pteris esculenta), a com-

mon fern of the Australian region allied to the British bracken. Its root stock is eaten by pigs, and when roasted is a favourite food of the

Tarai, a dist. in the Kumaun div. of the United Provinces of India. covers an area of 776 sq. m., and (as its name implies 'moist land') it is most unhealthy. It is watered by the Deoha R., and many small streams. Elephants, leopards, and tigers abound. Pop. 118,000.

Tarakal, a large island of the Pacific off the coast of E. Siberia, Asia, between the Sea of Okhotsk and the

Bay of Aniva, separated from the continent by the Gulf of Tartary.

Taranaki, a dist. lying in the S.W. of the North Is., New Zealand, with an area of 3811 sq. m., and a pop. of 45,000. Mostly forest land, the restricted mainder is utilised for stock-raising mainder is utilised for stock-raising and dairy-farming, much butter and cheese being produced. New Plymouth is the cap. and port.

Tarancon, a com. of Spain, and the cap. of the dist. Tarancon, 48 m.
W.S.W. of Cuenca. Pop. 5300.

Tarantism, or Tarantulism, an applicable dancing mania which

which dancing epidemic mania spread over the greater part of Italy in the 16th and 17th century. symptoms originated with a great dread of the bite of the tarantula, which, though sufficient to pierce the skin, is found to be incapable of giving rise to the hysteria and other symptoms of the mania. It is said that the *Tarantella* dance is called after it, by reason of the alleged cura-

tive efficacy of this rapid measure.

Taranto (the ancient Tarentum), a fort. tn. and scaport of S. Italy, in the prov. of Lecce, on the northern extremity of the Gulf of Taranto. It has a fine cathedral and monasteries, nunneries, hospitals, etc. The manufs. include velvet, cotton, soap, and oil, and there is a trade in olive oil, grain, oysters, mussels, etc. The islands of St. Peter and St. Paul, each having a lighthouse, protect the outer harbour. Pop. 65,000. See TARENTUM

for history, etc.
Taranto, Gulf of, a gulf of the Mediterranean sea, bordered by the provinces of Cosenza, Potenza, and Lecce. It has a length of 70 m. and an average breadth of 20 m.

Tarantula, the name for various large, formidable - looking spiders, European and American, but correctly applied to a few relatively small species of the genus Lycosa. See SPIDER.

Tarapaca, a prov. of N. Chile, which may be divided into three districts, running from N. to S., parallel with the coast. The district nearest the coast has deposits of guano, sulphate of soda, and salt, and copper, silver, and nickel in the mountains; gold has also been found. A narrow strip, 3 m. in breadth and 250 m. long, to the eastward, contains large deposits of

nitrate of soda, whilst eastward again stretches the Pampa of Tamangal to the Andes, the only portion of the province where agriculture is practised.

Tarapoto, a tn. of Peru in the dept. of Loreto, 50 m. S.E. of Moyobamba.

Pop. 9000.

Tarare (ancient Taratrum), a tn. in the dept. of the Rhone, France, 22 m. N.W. of Lyons. The chief industry is the manuf. of muslins (introduced in the 19th century); silk, plush, and velvet fabrics are also made. 13,000.

Tarascon, a tn. in the dept. of Bouches-du-Rhone, France, situated on the l. b. of the Rhone, 50 m. N.N.W. of Marseilles. The manufs. include cloth, serge, and silk, soap, etc. It is perhaps best known by Daudet's Tartarin de Tarascon. Pop. 9000.

Tarashcha, a tn. of Kiev. Russia, and 80 m. S. of Kiev city, with flour-

mills. Pop. 15,000.

Tarasp, a vil. of Switzerland, in the canton of Grisons, Lower Engadine, 28 m. N.E. of St. Moritz. It is frequented for its mineral baths. 400.

Tarawera Mt., a peak of New Zealand, situated in the Hot Lakes District of the North Is., 90 m. N. N. W. of Napier. On June 10, 1886, an eruption destroyed the famous pink and white terraces of Rotomahana.

Taraxacum, a genus of composite plants with a milky juice. T. officinale, or Leonlodon taraxacum, is the common dandelion. T. montanum is

sometimes grown in gardens. Tarazona: 1. A tn. in the prov. of Saragossa, Spain, situated on the Queiles, 40 m. N.E. of Soria. Pop. 9000. 2. A tn. in the Murcia prov. of Spain, situated 19 m. W.N.W. of Albacete. Pop. 5000.

Tarbagatai, a mountain range in Russian and Chinese Turkestan, extending over 200 m. Its highest point is Muz-tau (11,920 ft.), and the best pass is Say-assu, which leads to Chuguchak,

Tarbort: 1. A vil. of Argyllshire, Scotland, situated on Tarbort Bay, 30 m. N.N.E. of Campbeltown, with an ancient castle, erected by Robert the Bruce. Pop. 1900. 2. A vil., co. Kerry, Ireland, on the Shannon R., 61 m. S.E. of Kilrush.

Tarbes, cap. of the dept. of Hautes Pyrenées, France, situated on the Adour R., 12 m. N.N.W. of Bagnères de Rigorre. It has manufactures of paper, flax, woollens, felt, machinery, etc. Pop. 28,000.

Tarbolton, a tn. of Ayrshire, Scotland, 6 m. E.N.E. of Ayr. Pop. (1911) 4593.

Tardieu, Jacques Nicolas (1718-95), an engraver, son of Nicolas Henri T

(q.v.). He received his artistic tuition | Scotland. Such small Ts. came into from his father, became a member of the French Academy, and reproduced pictures by Nattier, Vanloo, and Boucher.

Tardieu, Nicolas Henri (1674-1749), a French engraver, born at Paris; he lived there chiefly till his death. He was a member of the French Academy, and did many plates after Rubens, while his works also include a fine rendering of Watteau's masterpiece, 'L'Embarquement pour l'Île de Cythère.

Tardieu, Pierre Alexandre (1756-1844). an engraver, nephew Jacques Nicolas T. (q.v.). Besides doing numerous plates after the old masters he reproduced many por-traits by his contemporaries, notably one of Marie Antoinette by Dumont and another of Napoleon by Isabey.

Tardigrada, Bear Animalcules, or Sloth Animalcules, an order of Arachnida. The name was formerly given to a family of Edentata, containing

the sloths.

Tare, or Vetch (Vicia sativa), a leguminous plant with trailing or climbing stems and compound pinleaves and reddish-purple The tares of the parable flowers, (Matt. xiii.) are probably darnel (Lolium temulentum).

Tare and Tret, certain deductions made from the gross weight of merchandise in bags, cases, etc. The weight of the vessel in which the goods are packed is known as the tare, and the gross weight, minus the tare, is the net weight. The tare may be calculated by weighing a few packages and taking the average (average tare); or in some kinds of merchandise the packing cases are assumed to be of a certain usual weight (customary tare); or the actual tare may be ascertained. The allowance for loss in transit, waste, etc. (20 of the net weight) is known as tret.

Tarentum: 1. (Gk. Tapás), a Greek supposed to have founded by Spartans (the only colony which Lacedemon possessed) about 700 B.C. The city was the residence of Pythagoras, and the headquarters of Pythagorism. After being autonomous until the 4th century B.C., T. was occupied by the Greeks, and in 272 B.C. was captured by the Romans. Ur evolted during the second Punic War, but was retaken in 207 B.C., and was subsequently an ally and (in 123) a colony of Rome. It was taken by the Saracens in 830. 2. A bor. of the Saracens in 830. 2. A bor. of Allegheny co., Pennsylvania, U.S.A., situated 21 m. N.E. of Pittsburg. It

very general use as armour ceased to be worn. From its similarity to the T., the objects at which archers, and later riflemen, aim at was also called a T. In archery a T. is a circular frame of straw, painted with concentric rings of 4½ in. width; there are five rings, counting respectively 1, 3, 5, 7, or 9 points. Until fairly recently 'match' Ts. of rectangular shape were solely in use for soldiers; the 'bull' counted 4 points, the inner ring 3, and either a 'magpie' (a shot in the second of the T.'s two rings) or an outer, 2 points. 'Service' Ts. which are now used in the British army consist of a brown head and shoulders consist of a brown head and shoulders shown against a dark canvas ground, etc. 'Disappearing' Ts., appearing and disappearing at Irregular intervals, are also used. In naval shooting the T. is a large wooden erection.

Targoviste, or Tirgoviste, the cap, of the dept. of Dambovitza, Roumania, 44 m. N.W. of Bucharest. It

has some interesting old buildings and an important arsenal. Pop. 9500.

Targum, an Aramaic paraphrase of the O.T. There are ten known Ts., the oldest of which is supposed to have been that of Onkelos which is confined to the Pentateuch. person and name of Onkelos have been for the last 300 years a crux criticorum. According to the Baby criticorum. According to the Baby-lonian Talmud, Onkelos (son of Calonicus or Calonymus), the prose-lyte, composed the T. on the Penta-teuch out of the month of R. Ell'ezer, and R. Yehoshus, who taught in the 1st and 2nd centuries. In the Jeru-salem Talmud the same thing is related on the same authorities, and almost in the same words, of the proselyte Adulla of Pontes, whose Greek version of the Bible was much used by the Greek-speaking Jows down to the time of Justinian. From facts seen some still argue that Onkelos is but another name for Aquila, and that the Greek trans-

lator also wrote one T. Tarifa (Rom. Julia Joza or J. Transdicta), a scaport in the prov. of Cadiz, Spain, 20 m. W.S.W. of Gibraltar. This town, whose characteristics are quite Moorish, has a constituted when her Transfer. fortress on an island near by. It is

engaged in tinning and anchovy-fishing. Pop. 14,000.

Tarill (from Tarifa, a tn. in Spain, at the entrance of the Strait of Gibraltar, where duties were formerly collected), denotes a list or table of goods with the duties or customs to be paid for the same, either on imhas manufactures of glass. Pop. 5000. portation or exportation, whether Target, or Targe, the name given to the small round shield which was used by the wild Celts of Ireland and on between the governments of two

ships with each other. The present English policy is to impose only a few duties for purely revenue purposes (see Customs Duties), but prior to the changes of Sir Robert Peel, there were over one thousand dutiable articles. No more stringent protective system, though existing in the in-terests of revenue, could well be imagined than that of England at the close of the Napoleonic wars in 1815. Most articles of consumption, together with raw material, were subject to high duties, while foreign manufactures were in some cases prohibited, and in most, if not all, penalised under heavy differential differential rates. Yet in spite of all these duties, English manufactures prospered, owing to the complete disorganisation of industry on the continent and the application of inventions (see also TARIFF REFORM). On the continent up to about 1850 rigid protection, or in many cases, prohibition, prevailed, except in Prussia and Switzerland. The change came with the celebrated treaty between England and France of 1860 (the work of Cobden and Chevaller). The rapid growth of trade between the two signatories to the treaty soon led other European nations to safeguard themselves by concluding a veritable network of treaties, securing a lower scale of duties, and the stringent system of the Restoration of the monarchy in France at last gave place to one of low duties, and moderate protection on manufactures and the almost complete relief of raw material from duty. In Germany conditions were always somewhat different; prior to the Zollverein (see CUSTOMS UNION) there obtained among the states of the Germanic Confederation a moderate scale of duties based on the Prussian T. of 1818. Up to 1850 there was a gradual and retaliatory system of Ts., which only weakened after the Anglo-French treaty. After this a treaty was concluded between France and Prussia (1862), which three years later was extended so as to embrace the entire Zollverein. The Franco-German War, in its consequences, and a general wave of agricultural depression, caused a reaction to protectionist principles after 1870, and the result has been that most European countries, except Great Britain, are now protectionist, though Holland and Belgium have, generally speaking, adhered to the system of moderate duties. Most British colonial Ts. are protectionist, but nowhere perhaps is the contrast between English com-

states having commercial relation- the protectionist principle began with the relief accorded in 1816 to 'infant industries' struggling against the competition of the English manufacturers. See Bastable. The Commerce of Nations.

Tariff Reform, the name specifically appropriated to the fiscal policy. inspired by Mr. Joseph Chamberlain, which seeks to end the long régime which seeks to end the long regime in England of free trade principles, and to replace it by a system of duties on imports. It need hardly be said that when at the close of last century Mr. Chamberlain took up this policy, there was nothing original in the idea of its application to the British commercial system. Rather did it require some fifty years ago all the economic brilliance of Mill, M'Culloch, and others, working on the basic principles of Adam Smith, to repel the dogmas of the so-called 'Mercantile System' (q.v.); a mission which was accomplished in such thorough fashion that the policy of free importation which goes by the name of 'Free Trade' (q.v.) has name of 'Free Trade' (q.v.) remained to the present day, political exponents of free principles in the early forties, when as yet the unrepealed Corn Laws appeared to obstruct every avenue to progress, were Cobden and Bright, the leaders of the 'Manchester School.' A war, however successful in its immediate result, is almost necessarily followed by a period of necessarily followed by a period of general distress, and as necessarily gives rise to political expedients to alleviate that distress. During the South African War of 1900 a corntax, ostensibly a temporary one, levied purely for war purposes, was imposed by the Conservative government. When leter Mr. Bitchie proment. When later Mr. Ritchie proposed to remit the tax, many of the members of the Conservative party proposed, contrary to popular expectation, to retain the tax. Mr. Chamberlain, while agreeing to the remitting of the tax, so far as the colonies were concerned, was favour of retaining it as against foreign countries. In the result the tax was wholly remitted (1902), but it was apparent to every observer of the political horizon that a serious rift had occurred in the Unionist party. Mr. Chamberlain at a speech in Birmingham outlined his views on T. R., or 'fiscal reform' as it was then called. His main idea, and it was undeniably a strong one, was that unless Great Britain revised its existing fiscal policy, no assistance for colonial development could come from the mother country. mercial policy and that of any other Chamberlain resigned, and shortly great country more marked than in the U.S.A., in which latter country firmed Unionist free trader, also

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resigned. The extraordinary debacle | commerce is believed to be contingent of 1906, when the Liberals were returned by an overwhelming majority, indicated that the time was by no means ripe for any reversion to protectionist principles. Nevertheless the Unionist party continued, in opposition, to press the claims of T. R. on the attention of the electorate, though Mr. Balfour, as leader, revealed all his wonted dialectical revealed all his wonted dialectical subtlety in avoiding any direct pronouncement in favour of a 'whole-hogger' policy as distinct from a mere system of preferential tariffs in the interest of the colonies, or, at most, a system of retaliation; which least experts however as indicated last system, however, as indicated below, is not easily distinguishable from either reciprocity (q.v., and Commercial Treaties) on the one hand, or, on the other, protection pure and simple. Matters reached a climax when Mr. Lloyd George presented before parliament his celebrated Budget of 1909.

Different economic aspects of Tariff Reform.—As stated from a purely partisan standpoint by Mr. J. M. Robertson, M.P., T. R. endeavours trading countries; but it is at least a natural inference to suppose that a methods, which mean th

of imports of food, with

rates for empire products a set-off to the burden of increased both food-prices, it promises the workers natio that 'their wages will always increase of Ei faster than food prices, and they will ment in this respect has not yet have constant "work for all." But found expression in a revised tariff the protagonists of T. R. have repeatedly disclaimed any intention of either food-stuffs or material, though, as will appear from a consideration of the arguments advanced in the articles PROTECTION and MERCANTILE SYSTEM, it is difficult to see how a tariff system can avoid such taxation, and, as shown above, the whole movement began in the desire to retain a war-tax on corn as a permanent impost. The weight of English opinion would seem to in connection with the fear of over be against the ass Protection or any exclusion of all out

the general productiveness of industry determines whether wages shall be high or low, and that the productive power of home industries depends not on any adverse body of or but upon the guidanc

dual self-interest. it is probable that the

some of the chief

Englishmen are still inclined to accept the truth of the doctrine of free trade, many think free trade is good only if followed in other countries as well as in England, or, in Mr. Bastable's cheaply than it could itself supply words, 'the wisdom of unrestricted them. Tariff duties on imports must

on its adoption by the other parties concerned.' In this connection must be noticed the distinctions between Reciprocity and Retaliation, though, inasmuch as both these principles involve placing restrictions on foreign trade as against allowing trade to follow out its own supposed natural laws, they are at bottom mere forms of protection. The advocates of reciprocity maintain that free trade is injurious unless other countries adopt it; those of retaliation, that free trade is good in itself, but that to revenge the injuries inflicted by foreign duties on us, or to compel their abandonment, we ought to impose corresponding duties on the goods of protectionist countries. This distinction seems to offer no more than a contrast in motives, and in practical politics the two views are often hopelessly confounded. Bastable and Professor Sidgwick and others all think that none of the leading advocates of free trade ever body of opinion in the ive always thought so,

must be ascribed to the continued belief in the validity of the free trade principle as a theory, or, conversely, to the refutation of both reciprocity and retaliation by leading economists. Reciprocity,' says Mr. Bastable, assumes that restriction gives advantages to the nation that employs it, at the cost of still greater injury to foreigners,' an assumption based on the belief that trade is lucrative only to importers (the term 'dumping -sed contemptuously

the country of pro-which in its turn rgaining, it is clear that

commerce is the result. in the comparative cost

e of surplus foreign

the price obtaining

alone are injurious (see also IMPORTS AND EXPORTS). Finally, it is to be observed that but little support for reciprocity is to be derived from the belief that protective duties fall wholly or partly on the foreigner. The catch-phrase make the foreigner pay ' takes no account of the probable effect on prices to the consumer. Retaliation, in so far as it differs from reciprocity at all, does so only by reason of the fact that its advocates stoutly maintain their adherence to the principle of free trade, regardless of the fundamental meaning of that principle as expounded by Mill, Cobden, and others, who concur in defending it against all criticism founded on the supposed evils of conseided economy. Betalictory Retaliatory one-sided economy. duties would not inconceivably result in still higher countervailing duties on the part of the country against which they were directed, a result which would certainly render the adoption of universal free trade far more remote than ever. To take more remote than ever. concrete instances, it is doubtful whether either the U.S.A., Canada, France, or Italy, have improved their commercial positions by means of retaliatory duties. Mr. Bastable says with considerable force that the strongest reason against the adoption of retaliation by such a country as England, whose imports are mainly food and raw material and exports mainly manufactured articles, is that foreign countries desirous of developing their manufacturing industries would not be de-terred by threats of retaliation from a nation so advanced in trade, but would, on the contrary, rather welcome any check on their exports of raw material.

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tion, 19: 1906;

the Fiscal Problem, 1903, and Through Preference to Protection, 1907; Stanwood's American Tariff Con-1903; troversies in the 19th Century, 1903 A.C. Pigou's The Riddle of the Tariff.

Tarija: 1. A dept. of Bolivia. chief industries are stock-raising and agriculture. Area 70,800 sq. m. Pop. 130,000. 2. The cap. of the dept., 180 m. S.E. of Sucre. Pop. 8000.

Tarik, sce Gibraltar.

pro tanto obstruct the realisation of Yarkand-darya, the Kashgar-darya, this advantage; but though, if foreign and the Aksu-darya. The Kouchet-countries removed their restrictions, the gain of the country of importation would be proportionately greater, Kul, flows into the T., as do the tion would be proportionately greater, Kut, flows into the T., as do the that fact does not destroy the validity of the view that home restrictions are the view of the view that home restrictions and total proposed after flowing by and tortuous, and after flowing by the side of the desert of Takla Makan, and through the oases of Yarkmakashgar, Aksu, etc., it dies away in the marsh of Lop-nor, after a course of 1000 m. The area of its basin is 354,000 sq. m., of which over a half consists of arid deserts, including those of Takla Makan, Gobi, and The region has been ex-Kumtagh. Sven Hedin. plored by See his Through Asia.

Tarkastad, the cap. of a div. of the same name, Cape of Good Hope, S.

Africa. Pop. 2200. Tarlac, or Tarlag: 1. A pro... The chief Luzon Is., Philippines. products are rice and sugar. Area 1295 sq. m. Pop. 135,000. 2. The

cap, of the above prov., 65 m. N.N.W. of Manila. Pop. 12,500.
Tarlatan, a gauze-like muslin used for ladies' dresses, etc. It occurs in white and colours and is often printed. Tarare, 22 m. from Lyons, is the chief centre of this manuf.

Tarleton, Sir Banastre (1754-1833), the son of a Liverpool merchant, educated at Oxford. He went out to America with Lord Cornwallis at the time of the beginning of the War of Independence. T. held soveral commands during the war, and was present at the battles of White Plains and Brandywine. He was besieged by the Americans in Gloucester, and was compelled to surrender. On his return to England, T. devoted himself

to politics. Tarlton, Tarlton, Richard (d. 1588), a comedian, was distinguished for his performance of the clowns of the old English drama. One of his last performances was in *The Famous Victories of Henry V.*, this was in 1582 at the Bull in Bishopsgate Street. T. is known to have written at least one play, The Seven Deadly Sins, which, though never printed, and now lost, was much admired. There now lost, was much admired. is a portrait of T. in his clown's dress, with his pipe and tabor, in the Harl. MS. 3885; and a similar one on the title-page of a pamphlet called Tarllon's Jests, 4to., 1611. A copy of the former portrait is given in Knight's Pictorial Shakespeare, at the end of 'Twelfth Night.'

Tarn: 1. A dept, in the S. of France, once forming part of Languedoc, an old prov., and bounded on the N. by Aveyron. The chief Tarim, the principal river of rivers are the Tarn, Agout, and Chinese Turkestan, composed of the Aveyron, while it also contains the

spurs of the Cévennes. Its trade is feated the Latins and Sabines, and connected with wine, wool, and silk tradition relates that he also defeated goods, whilst coal, iron, and copper are to be found. Area 2231 sq. m. Cap. Albi. Pop. 324,090. 2. A river of France, rising in the Cévennes and flowing into the Garonne. The chief towns on its banks are Albi and Montauban. Length 225 m.

Tarn-et-Garonne, a dept. in the S. of France, originally part of the old dept. of Guienne. The chief rivers are the Garonne, Tarn, and Aveyron. Area 1440 sq. m. Chief products cereals, fruit, and wine. Chief manufs. woollen and silk goods. Cap. Montauban. Pop. 182,537.

Tarnopol, a tn. of Galicia, Austria, 78 m. E.S.E. of Lemberg. It distils spirits and manufs. flour.

Tarnow, a tn. in Galicia, Austria, 4 m. W. of Lemberg, on the unape. The chief building of in-164 m. Dunape. terest is the cathedral, and the chief manuf. agricultural implements. Pop. 37,263.

Tarnowitz, a tn. in Silesia, Prussia, 45 m. S.E. of Oppeln. The chief industries are brewing and iron manuf.

Pop. 13,574.

Taro, see Tara.

Tarots, see CARDS, PLAYING. Tarpaulin, a large sheet of the coarsest kind of linen or hempen cloth, saturated with tar to render it waterproof. It is used for covering loaded wagons, the hatchways of ships, and similar things as a temporary protection from wet.

WATERPROOF.

Tarpeia, daughter of Sp. Tarpeius, the governor of the Roman citadel the Saturnian hill, afterwards called the Capitoline; was tempted by the gold on the Sabine bracelets and collars to open a gate of the fortress to T. Tatius and his Sabines. As they entered they threw upon her their shields and thus crushed her to death.

Tarpon (Megalops atlanticus), plentiful littoral fish ín warm American seas. It grows to a length of 7 ft. or more, and to a weight of over 200 lbs., the scales, which are tough like thin horn, sometimes being

as much as 5 in. in diameter.

Tarquinii, in ancient geography, a city of Etruria, 45 m. N.W. of Rome, near the modern Corneto. It was the original residence of Tarquinius Priscus, and one of the chief cities of the Etruscan League.

Tarquinius, the name of a family in early Roman history, to which the fifth and seventh kings of Rome belonged: Lucius Tarquinius Priscus (616-579 n.c.), fifth King of Rome, was beloved by his people on account of his wisdom and courage. He de- type, produced in Catalonia, Spain.

the Etruscans. He was murdered after a reign of thirty-eight years. Lucius Tarquinius Superbus (534-510 B.C.), the seventh King of Rome. His cruelty and tyranny obtained for him the surname of 'Superbus.' But, though a tyrant at home, he raised Rome to great influence and power among the surrounding nations. He defeated the Volscians and took Gabii by stratagem. Owing to an outrage committed by his son, Sextus, on Lucretia, the wife of his cousin, Tar-quinius Collatinus, Tarquinius Superbus and his family were exiled in 510 B.c. The people of Tarquinil and Veil espoused the cause of the exiled tyrant, and marched against Rome. but they were unsuccessful. T. next repaired to Lars Porsena, King of Clusium, who marched against Rome, but was induced to make peace with the Romans. Thereupon T. took refuge with his son-in-law, Mamilius Octavius, who induced the Latin states to declare war against Rome, but they were defeated in the battle of Lake Regillus. T. then fled to Aristobulus at Cumæ, where he died.

Tarragon (Arlemisia Dracunculus), an aromatic perennial plant, the green or dried leaves of which are used for flavouring vinegar, and also in cookery. The plant is propagated

by division or by cuttings in spring.
Tarragona: 1. A maritime prov.
in the N.E. of Spain, bordering on
the Mediterranean Sea. It has an area. of 2505 sq. m. and a pop. of 339,042. On its fertile mountain slopes are vineyards and orchards, producing There is excellent wine and fruit. much forest land, yielding valuable timber, whilst copper, lead, silver, lime-stone, and marble are found. 2. (Ancient Tarrace.) A seaport and the cap. of the above prov., is situated at the mouth of the Francoli, 45 m. W.S.W. of Barcelona. It stands on an eminence about 600 ft. high, and partly on the low ground beneath it, forming an upper and a lower town. both of which are fortified. its archæological remains are amphitheatre, theatre, circus, and aqueduct. It is an archbishop's see, with a fine cathedral and palace. The port carries on considerable trade. but its harbour can only accommodate coasting vessels. T. was originally a Phenician settlement. Later it was captured by the Goths and ruined by the Moors. Rebuilt in the 11th century it has in turn been captured by the English (1705) and the control of pillaged by the French (1811).

25,000. Tarragona, a port wine of a tawny

Tarrasa, a tn. in the prov. Barcelona, Spain, 15 m. N.W. Barcelona. The chief manuf. of is

woollen cloth. Pop. 16,000.

Tarruntenus Paternus, a Roman jurist, was the author of De Re Militari, two excerpts from which

are in Justinian's Digest.

Tarrytown, a vil. of New York in Westchester co., on the Hudson R., 25 m. N. of New York City, famed as the 'Sleepy Hollow' of Washington He lies buried here. Irving's story. B Pop. (1910) 5900.

Tarshish, a place or region which is mentioned several times in the O.T. It was probably the ancient Tartessus, and was situated in Spain near the mouth of the R. Guadalquivir. Tartessus was a noted centre of commerce. See Ezek. xxvii. 12, etc.

Tarsipes rostratus, the Noolbenger, a tiny marsupial, native of Western Australia. It is arboreal in habit, and

Tarsus, a city of Cilicia in Asia Minor, on the R. Cydnus, represented to-day by the modern Tersus. It is now chiefly remembered for its connection with St. Paul. See Sir W. M.

Ramsay's Cities of St. Paul.

Tartaglia, Niccolo (c. 1500-57), born at Brescia. He was mainly interested in the scientific and mathematical problems of gunnery and the art of warfare, particularly in projectiles. In 1521 he was a teacher of mathematics in Verona, and discovered a matics in Verona, and discovered a method of solving certain cubic equations. His chief works are: Nova Scientia, 1537, and General Trattato di Numero e Misure, 1556 and 1560, the latter dealing with arithmetic, algebra, geometry, and mensuration. Tartan, or Plaid, a pattern woven in cloth, in which bands of different colours are woven on writed side by

colours are woven or printed side by side, both the warp and west way of the material, thus giving the wellknown checkered pattern. The socalled shepherd's plaid of Scotland is known to have a very remote antiquity amongst the eastern nations of the world. These plaids were in great favour in the Highlands of Scotland, where each clan wore a particular kind as its distinctive dress.

Tartar Emetic, or Potassium Antimonyl Tartrate (C₄H₄O₅K(SbO)+
½H₂O), is prepared by boiling potassium hydrogen tartrate with antimonious oxide and water. It is readily soluble in water, and is used in dyeing as a mordant and in medicine as an emetic.

Tartaric Acid, or Dihydroxysuccinic Acid (C4H4O4), is a commonly occurring vegetable acid, and is con-

It is also the name of an Australian tained in grapes and other fruits.

Tarrasa, a tn. in the prov. of mentation of grape-juice, impure mentation of grape-juice, impure potassium hydrogen tartrate or argol is deposited. From this salt the com-mercial acid is prepared. The crude argol is partially purified by re-crystallisation from hot water, and it is then boiled in solution with chalk. Calcium tartrate is deposited and the T. A. is set free from this by treating with dilute sulphuric acid. The acid forms large transparent crystals, is readily soluble in water and alcohol, but insoluble in ether (melting point 167° C.). Like other dicarboxylic acids, it forms both hydrogen and normal salts. The acid salt is known as 'cream of tartar' and the potassium sodium salt as 'Rochelle salt.' T. A. is used in the

preparation of effervescing drinks and in baking-powders. There are four optical isomerides of the acid, viz. dextro-tartaric, levo-tartaric, mesotartaric (inactive), and racemic acid

(inactive). Tartars (properly Tatars), a term applied somewhat loosely to mixed races inhabiting parts of Siberia, Turkestan, and the Steppes. They are, fact, a Mongolo-Turki people. in though the name was first given to certain tribes of the Tunguses. In the middle ages, however, it was made to include the warriors of Mongolian and Turkish origin who followed the redoubtable Genghiz Khan, and whose exploits and deeds of savagery left so Europe. lively an impression on Indeed, it was probably about that time that their original name of 'Tatar' became altered to 'Tartar. from a fancied connection with the Greek word tartaros, hell. The fierceness of the T. has passed into a proverb. In modern times the word proverb. In modern times who is used to denote a heterogeneous variety of tribes, including the Kirghiz, a nomadic race inhabiting the Steppes, the Kalmucks, Kipchaks, and Crim Ts., the blending of the races, and the mingling, in varying degrees, of Mongolian and Caucasian characteristics, being exceedingly puzzling to ethnologists.

Tartarus, son of Æther and Ge, and by his mother Ge the father of the Gigantes. Typhœus and Echidna. In the *Iliad* T. is a place beneath the earth reserved for the rebel Titans, as far below Hades as Heaven is above the earth. Later poets use the name

as synonymous with Hades.

Tartary, or Tatary, a term formerly given to Central Asia, on account of the inroads of Tartar hordes in the middle ages. It comprised the whole central belt of Central Asia and E. Europe, from the Sea of Japan to the Dnieper, including Manchuria, Mongolia, Chinese Turkestan, Independent Turkestan, the Kalmuck and Kirghiz steppes, and the old khanates Astrakhan. Kazan. and Crimea. But latterly the term had a more limited significance, and included only Chinese Turkestan and Turkestan.

Tartini, Giuseppe (1692-1770), an Italian composer and violinist of the same tradition as Corelli and Vivaldi. born at Pirano. In 1728 he started a violin school. His compositions for violin comprise over 100 sonatas and as many concertos, including the

famous Devil's Trill sonata,

Tarudant, the cap. of the prov. of Sus, Morocco, about 125 m. S.W. of Morocco, and between the R. Sus and the Atlas Mts. The chief minerals are copper, gold, iron, and silver, while copper goods are manufactured, and dyeing and tanning carried on. Pop. (estimated) 35,000.

Tar Wood, see TAR.

Tasgaon, a tn. in the Satara dist., Bombay, India, 58 m. S.E. of Satara. Pop. 11,500.

Tashi Lama, or Teshu Lama, one of the two great lamas of Tibet. He is the head of the great monastery of Tashilhunso, and while he does not possess the secular authority of the Dalai Lama, he is equal to him if not superior spiritually. During the absence of the Dalai Lama after the During the British Expedition of 1904, he was the head of Lamaism in Tibet. Lamaism.

Tashkend, or Tashkent, the cap. of the gov.-general of Russian Turkestan and of the ter. of Syr-Daria, situated on a trib. of the Syr-Daria, 160 m. N. of Samarkand. The city is divided into two—the native one and the new Russian one—and is well built and has many large public edifices. The trade of the city is important, the chief manufs. being leather goods, metals, and textile fabrics. Pop. 165,000.

Tashkurghan, the chief place in the dist. of Khulm, Afghan Turkestan, 1 m. S. of the ruined town of Khulm. It is an important trading centre.

Pop. 10,000.

-- a tn in Bhutan, 131 , has a large sts.

centre.

(c. 1602-59), cplorer. The exact date of his pirin is not known, but the date above given is surmised. He was commissioned by the governor-general of Batavia, Van Diemen, to discover the Great South Land.' Whilst on this exploit he was successful in discovering Tasmania which he at first named Van Diemen's Land,

Tasman Glacier, situated in the S. of the South Is. of New Zealand: it was discovered in 1862 by Julius von Haast. It has a total area of just over 20 sq. m., and lies practically at the base of the mountain heights of the Southern (New Zealand) Alps.

Tasmania. This island, which forms Commonwealth of Australia, is separated from Victoria by the Bass Strait which is about 140 m. wide. In area it is a little smaller than Scotland, and is the smallest of all the Australian colonies as well as the most temperate and pleasant. The N. coast forms a concave curve flanked by the island groups of Fur-neaux (E.) and the Hunter and King Is. (W.). The northern and westerly coasts are not greatly indented, but have some good harbours. The E. coast is much more indented, whilst the S. and S.E. coasts are formed of a series of curiously shaped peninsulas. Area, including dependent islands, 26,215 sq. m. Pop. 190,898.

Configuration and rivers. — The island is made up of ancient palco-

zoiestrata which have been penetrated by the harder masses of igneous rocks. The whole of the surface of the island is broken up by the full rivers into gullies and steep mountain slopes. Running almost parallel to the E. coast is an irregular range of mountains which finds its highest point in Ben Lomond, which rises to a height of 5000 ft. A line of depression formed by the river valleys of the Tamar, Macquarie, and Coal forms a natural means of communica-tion between N. and S. The whole of the centre of the island is a plateau which, as it proceeds westward, breaks up into short mountain ranges and culminates in Mt. Cradle (5070 ft.). About the centre of the island and practically at the highest point of the plateau lies a number of fresh-water lakes. The largest of these is the Great Lake which lies at an elevation of nearly 4000 ft. and which has an area of about 48 sq. m. The chief rivers of the island are the Derwent, rising in Lake St. Clair and entering the sea at Storm Buy (130 m. long); the Huon, which enters the sea at D'Entrecasteaux Channel (100 m. long); and the Tamar, which in reality is an estuary formed by the junction of the Esk and the Macquarie, which drain the E. depression and receive tributaries from the lakes of the

Mineral resources .- The country is on the whole very rich in mineral resources. The chief mining industry is tin, which is mined in great quanti-1642. An English edition of his journal ties at Mt. Bischoff and at Branz-from 1642-44 was published in 1898. holme. Copper and antimony are

most parts of the island, and coal is also fairly plentiful. Amongst other minerals found in greater or less quantities are bismuth ore, slates, marble, and building stone.

Climate, etc.—The climate is mild and equable, resembling that of the southernmost parts of the British Isles. The vegetation of the island is practically identical with that of Australia; the eucalyptus is the most predominant feature. The island is very well wooded, and the interior still yields a valuable supply of timber. The fauna in general is that of Australia, but there are one or two species peculiar to the island, i.e. the Tasmanian devil and the tiger or striped wolf, which, because of the enormous damage it did to the sheep, is now practically extinct. The platypus is more common in T. than in Australia. Fish of all

kinds are found in great abundance.

Industries and trade.—Sheep rearing and agriculture are the principal occupations. Fruit and hops are grown in huge quantities for exportation. The leading exports are wool, gold, silver, and tin, and the chief imports are textiles, manufactured goods, and provisions. The chief trade of the island is carried on with Victoria and the British Isles. The principal towns are connected by railway, but the inter-communications are as yet not good. The main railway line runs between Hobart and Launceston, the chief towns. Total imports (1911) £3,309,506; exports (1911) £4,529,331. This includes This includes inter state trade.

History and government.—T. was originally called Van Diemen's Land, and was discovered by Tasman in 1642. In 1777 it was visited by Cook, who, however, thought that it formed part of the mainland. It was proved an island by circumnavigation by Bass and Flinders in 1798, and in 1803 was annexed by the British Crown as a dependency of New South Wales. The site of the present capital was originally a convict settlement, and the transportation of convicts to the island continued until 1853. The The island was granted responsible govern-ment in 1856, and the name of the island was changed to T. The Houses of Parliament consist of a House of Assembly and a Legislative Council, whilst the Governor represents the The Parliament is elected by King. both sexes.

Aborigines.—These numbered in 1803 about 5000, but they are wholly extinct now, the last of them having died in 1876. The British treatment towards them was cruel, and for the and religious mania. Meanwhile, La

found at Mt. Lyell, and silver is first thirty years after the settlement mined in the W. Iron is found in a constant war was waged between native and settler. Finally, about 1850, some attempts were made to preserve them on reservations, but the attempt ended in failure.

Bibliography.-Bonwick, The Last of the Tasmanians (London), 1870; Fenton, History of Tasmania (Laun-ceston), 1884; Just, Official Hand-book of Tasmania (London), 1892. Tasmanian Devil (Dasyurus ursinus),

a marsupial which occurs only in Tasmania. It bears an external resemblance to a small bear with a long tail, and is brownish black in colour with a broad white band across the chest. It is very fierce and bloodthirsty, and often destroys poultry

and even sheep.
Tasman Sea, the name given by
the British Admiralty to the Pacific waters which lie between New Zealand and Australia and Tasmania.

Tassie, James (1735-99), a gemengraver and modeller, born at Pollok-shaws near Glasgow. He met Quin at Dublin and with him invented the 'white enamel composition' which he used for his medallion portraits and reproduction of gems. The 'Descrip-tive Catalogue '(1791) of Rudolph Eric Raspe enumerates 16,000 pieces from his hands, but before his death this had reached 20,000. His nephew, William Tassie (1777-1860), was also an engraver and modeller, and won the lottery for Boydell's Shakespeare Gallery in 1805. He executed, amongst other works, a very fine portrait of Pitt.

Tasso, Bernardo (1493-1569), born at Venice. A poet of high contemporary standing, now remembered rather as the father of Torquato T. (q.v.) than as a lyrical poet. Technically skilful his poetry was marred by exaggeration and bombast, imitatat Padua, he became secretary to works, mostly published posthumously, include Amadij (1560), Floridante (1587), Lyrics (1749). Life mously, by G. Camperi.

Tasso, Torquato (1544-95), one of the finest and most widely influential Italian poets, son of Bernardo T. (q.v.), born at Sorrento. In 1560 he was sent to Padua to study law, but, influenced by the literary environ-ments of his early years at Rome and Venice, he devoted himself to literature and philosophy. Two years later he produced Rinaldo, a romantic poem dedicated to Cardinal Luigi d'Este, who later became his patron (1565).From 1578-86 T. was imprisoned in a madhouse, probably on account of his extreme eccentricity

Gerusalemme Liberata had been com- thropist, born at Nosari in Baroda, pleted (1575) and submitted to several critics. On his release T. went to Mantua as the protégé of Prince Vincenzo Gonzaga, and here he rewrote his great epic in accordance with his critics' suggestions. The result, La Gerusalemme Conquistata (1592), was a feeble, pedantic effusion, in which he expurgated the fine passages of paganism and chivalry of the original edition on which his fame ultimately rested, e.g. those re-lating to the characters Erminia, Clorinda, and Armida. The last few years of his life were passed between Naples and Rome. In 1594 he was summoned by the pope to be crowned poet laureate, but he died on his arrival in Rome at the convent of 'Sant' Onofrio, without receiving the honour. T.'s poetry was an attempt to reconcile classic form (e.g. the Virgilian epic in Rinaldo) with a deeper note of personal sentiment. Besides La Gerusalemme his works include a delightful pastoral drama Aminta, a weak tragedy Torrismondo, a rather brutal comedy Gli Intrichi d'Amore, and many other plays and poems. Works, ed. Rosina, 33 vols. poems. Works, ed. Rosina, 33 vols. (Pisa); Lives by Milman (1850) and Hasell (1882).

Tassoni, Alessandro (1565-1635), an Italian poet, born at Modena. He was employed in several diplomatic missions when secretary to Cardinal Ascanio Colonna (1599-1608), and later in the service of the Duke of Savoy. La Secchia Rapida (or 'The Rape of the Bucket'), a burlesque epic; Pensieri Diversi, and Considerations course il Befurghe are bisiderations course il Befurghe are bisideratical course in the service of the Bucket's particular in the service of t siderazioni sopra il Petrarcha are his

principal works.

Taste, in physiology, the sensation caused by the application of certain substances in solution to organs situated on the tongue, and to a lesser degree on the soft palate, the uvula, The terand adjacent structures. minal organs of T. are small oval bodies known as taste-bulbs, less than 500 in. in length, and distributed unequally, but in enormous quantities, over the surfaces susceptible to the Substances which excite the sensation of T. must be in solu-tion. The process is probably dependent on chemical changes taking place inside the taste-bulb, and evidence is forthcoming which tends to prove that each taste-bulb is only capable of communicating one variety of sensation. Four Ts. are usually identified—sweet, bitter, acid, and All the other delicately differentiated sensations usually referred to the sense of T. are really smell sensations.

Tata, Yamsetji Nasarwanji (1839-1904), a Parsee merchant and philan- pest.

He formed a company to work the iron ores of the Central Provinces on modern principles, and effected the lowering of the freights on Indian goods to China and Japan. He also introduced a silk industry after Japanese methods into Mysore, and endowed a research institute at Bangalore.

Tatar, see TARTAR.

Tatar-Bazarjik, a tn. of Eastern Rumelia, Bulgaria, 23 m. W. of Philippopolis, on the Maritza. Pop. 18.000.

Tate, Sir Henry, Bart. (1819-99), founder of the 'Tate Gallery' of British art, born at Chorley in Lan-He was a sugar merchant, but spent all his leisure in devotion to the fine arts, and made a collection of pictures which he afterwards gave

to the nation. Tate, Nahum (1652-1715), an Irish poet, born at Dublin. He issued several volumes of poems, and was the author of some indifferent plays. His poem, Panacea, a Poem on Tea, is perhaps his best effort. In 1692 he was appointed poet laureate, and ten years later the office of historiographerroyal was bestowed upon him

Tatham, John (fl. 1632-64), a dramatist, was the author of the text of several city pageants, and wrote some plays and poems.

Tatian, the first Christian apologist, flourished in the latter part of the 2nd century. He was a Syrlan from the region of Mesopotamia. He was a Sorbiet and targets with a Sophist and taught rhetoric with much success. Coming to Rome, he was converted to Christianity and became a disciple of Justin Martyr. He is famous as the author of An Apology to the Heathen, in which he defends the Christian faith and practice. He also wrote two lost works, A Harmony of the Gospels and Perfection after the Pattern of the Saviour. The Apology is generally printed with the works of Justin Martyr.

Tati Concession, a gold-mining dist. the British Bechnanaland Protectorate, with an area of 2500 sq. m., which was originally conceded by Lobengula in 1887. Chief town, Chief town.

Francistown.

Tatius, Achilles, an Alexandrian writer of romances, probably lived in the 5th century A.D. His Leucippe and Cleitophon is written in elegant Greek but has a rather improbable Greek out has a rather improbable plot; the characterisation is weak. It is printed in the Erotici Scriptors Græct, and there is an English translation by the Roy. R. Smith, 1855.

Tatra-Füred, or Alt-Schmecks, a watering-place in the co. of Szepes, Hungary, 125 m. N.N.E. of Buderecks.

Tatta, a tn. of Sindh, India, on the Indus, 54 m. E.S.E. of Karachi, once a town of importance. Pop. 10,000.
Tattersall, Richard (1724-95), born

at Hurstwood in Lancashire, but came from there at an early age to came from there at an early age to London, where he entered the service of the Duke of Kingston. He afterwards became an auctioneer, and established himself at first at Hyde Park Corner. Here he built up a great business as an auctioneer of high-class horses, and finally his place became a recognised region.

place became a recognised racing centre. In 1865 the premises were transferred to Knightsbridge.

Tattersall's, the name given to the establishment for the auction of horses, at present at Knightsbridge. Green, whence it was transferred from Hyde Park Corner in 1865. It was founded by Richard Tattersall (q.v.).

Tattooing, the name usually given to the custom common among many uncivilised tribes of marking the skin by punctures or incisions, and introducing into them coloured fluids, so as to produce an indelible stain. has been found in most of the islands of the Pacific Ocean, and among many of the aboriginal tribes of Africa and America, as well as, on a limited scale, in the East. The native chiefs of New Zealand tattoo the last the whole body in a variety of very the whole body in a variety of very last figures. It is elaborate symmetrical figures. It is done by puncturing the skin with sharp-pointed instruments till the blood flows, and then rubbing in char-coal. The marks which result are permanent, and appear black on a brown skin, while on the skin of a European they appear blue. The age for tattooing the males varies from eight or ten years up to about twenty; the females have only the face slightly tattooed. The Bedouin Arabs, the Tanguses, and other eastern tribes, and many tribes of American Indians, and many tribes of American Indians, still practise it. It prevailed amongst the ancient Thracians, and was distinctive of high rank. The ancient Britons also practised it, and traces of it lingered in England until after the Norman Conquest. Perhaps the practice of sailors and soldiers to print anchors and other marks on their arms is a role of it still subtheir arms is a relic of it still subsisting.

Taubate, a tn. in the state of São Paulo, Brazil, 78 m. E.N.E. of São Paulo. Pop. (dist.) 15,000.

Taubmann, Friedrich (1565-1613), a German philosopher and poet, a native of Franconia. He published editions of Virgil and Plautus; Dissertatio de Lingua Latina; Melodæsia; and Schediasmata Poetica. His wittleisms were published in His wittleisms were published in Taubmanniana, 1707.

Tatra Mountains, see CARPATHIANS. | time professor at Wittenberg Uni-

time professor at Wittenberg University, being appointed in 1595.

Taucha, a tn. in Saxony, 5½ m.

E.N.E. of Leipzig. Pop. 5379.

Tauchaitz, Karl Christoph Traugott (1761-1836), born near Grimma, Saxony; established a printing business in Leipzig in 1796 and a publishing house in 1798. His special publications were strengthroad editions. publications were stereotyped editions of the Greek and Roman classics, but he also printed Bibles and dictionaries. His son, Karl Christian Philipp, Tauchnitz (1798-1884), car ried on the business, and left money for philapthrapic purposes His ned on the obsiness, and leit money for philanthropic purposes. His nephew, Christian Bernhard, Freiherr von Tauchnitz (1816-95), also founded in 1837 a printing and publishing house in Leipzig, and began his Library of British and American Authors in 1841. In 1868 he began the collection of German Authors, and in 1868 the Student's Tauchnitz and in 1886 the Student's Tauchnitz editions appeared. He was ennobled in 1860, and made a Saxon life-peer in 1877. He was British consul-general for the kingdom and duchies

of Saxony (1866-95).

Tauern Alps, see Tyrol, Alps of.
Tauler, Johann (1290-1361), a German mystic, born in Strassburg. His Sermons, which are marked by sincere practical piety, were printed at Leipzig in 1498, but there is also a modern edition by Julius Hamberger, 1864, and R. H. Hutton published T.'s sermons for testivals under the title

of The Inner Way.

Taung-ngu, a tn. and cantonment in the district of the same name, Lower Burma, about 75 m. N.E. of

Prome. Pop. about 17,000.
Taunton: 1. A municipal and parl.
bor of Somerset, England, 30 m. N.E. of Exeter. It has a magnificent 15th century church, a hospital, which was originally a lazar house, of the 12th to 13th century, and the remains of a Norman castle which was built on the site of an old Saxon fort. The grammar school dates its founda-tion back to the 16th century. The chief products of the town are apples, cider, gloves, collars, and agricul-tural implements. Historically the town has played an important part in many ways. It was occupied by the pretender Perkin Warbeck in 1497. During the Civil War it was held for Parliament, and later in the neid for Parlament, and later in the same century it witnessed the proclamation of the Protestant 'King' Monmouth and the brutalities of Jeffreys and Kirke's 'lambs.' Pop. (1911) 22,563. 2. A city of Massachusetts, in Bristol co., of which it is the co. seat. It manufactures cotton goods and some meablease.' goods and some machinery. about 30 m. from Boston. He was for a (1910) 34,259.

Taunus Mountains, a range of mountains which stretches well over 50 m. in a north-easterly direction from the confluence of the Rhine and the Main. It is extremely well wooded and the lower slopes are particularly fertile. The vineyards which are situated there are of world-wide reputation and produce such famous wines as Rüdesheimer and Hochheimer. The chief mountain heights are Grosser Feldberg (2890 ft.) and Kleiner Feldberg (2715 ft.). On this range of mountains are situated some famous German spas, such as Homberg, Wiesbaden, and Ems, all of which are famous for their mineral springs. A national monument representing the figure Germania was here erected in commemoration of the war of 1870-71.

Taupo, a lake of North Is., New Zealand, situated in the centre of the island. The chief river flowing into it is the Walkato, while near its shores are volcanoes.

Tauranga, a tn. and harbour of North Is., New Zealand, on the Bay

of Plenty. Pop. 1000.
Taurica Chersonesus, or Tauric
Chersonese, also called the Tauric
Peninsula, was an ancient name for

the Crimes (q.v.).

Taurida, a gov. of Russia, having for its boundaries the Black Sea and the Sea of Azov. It includes the peninsula of the Crimea—where the scenery is mountainous and picturesque. Cereals are among the chief products, while the manufactures include flour and tobacco. Area 23,312

sq. m. Pop. 1,876,200.
Taurine (C₂H₇NSO₃), amidoethylsulphonic acid, a crystalline substance produced in the decomposition

Tauromenium, see TAORMINA.

Taurus, a range of mountains in the S. of Asia Minor extending from the R. Euphrates to the Ægean Sea. Portions of the range are known by different names, as Ala-Dagh, Bulgarthe height ranging from

Taurus, or the Bull (symbol 8), the second sign of the zodiac, which used to be the first of the year. It contains the beautiful star Aldebaran, and the groups Hyades and Pleiades, the last named being involved in nebula. Other nebulæ are the 'Crab,' discovered in 1731, and N.G.O. 155± and 1555, both variable. ¿ Tauri is a spectroscopic binary, period 138 days, the spectrum showing helium; R and S are Mira variables; λ has a dark companion, the period of celipse being 3.9 days. Boss has studied a globular cluster, 140 light years distant, and shown their common motion (see Stairs, diagram).

Taus, a tn. of Bohemia, Austria, 27 m. S.W. of Pilsen. It is a manufacturing town. Pop. 8170.

Tautog, or Black Fish (Tautogo ontits), a food fish which occurs off the Atlantic coast of N. America. It averages from 12 to 14 lbs. and is much valued in American fish markets.

Tavastehus, the cap. of the gov. of T., Finland, 60 m. N.N.W. of Helsingfors. Its castle, dating from the middle ages, is used as a prison. Pop. 5000.

Tavern, see LICENCES AND LICENSING LAW.

Tayernier, Jean Baptiste, Baron D'Aubonne (1605-89), a famous French traveller of the 17th century, born at Paris of Protestant parents, and commenced his career as a traveller in 1631, when he travelled to Turkey and Persia. During the succeeding years he travelled much in the East, visiting many places in Persia, Syria, and India. Finally he travelled through Batavia, and returned rid the Cape. He published his famous Six Yoyages in 1676, and a book dealing with his life and adventures was published in 1886 by Foret.

Taveta, a district of British E. Africa, near to Mount Killima-njaro, possessing an extremely rich vegeta-

tion.

Tayira, a seaport tn. of Algarve, Portugal, 20 m. N.E. of Faro. It trades chiefly in mineral waters and wines, and is also engaged in fishing. Pop. 12,000.

Tavistock, a tn. of Devonshire, England, 15 m. N. of Plymouth, on the R. Tavy. It has many fine buildings, chief amongst which are the parish church and the guildhall. There are also the romains of a fine abbey which was granted to the Russell family at the time of the Dissolution by Henry VIII. Part of this abbey now constitutes a public library. The chief industries are copper-mining and the extraction of arsenic.

Tayoy, a seaport, the cap. of T. district, Tenasserim, Lower Burma, 30 m. from the mouth of the Tayoy R. It is in a rice-producing region. Pop. 22,400.

Taw, a river of Devonshire, England, rising on Dartmoor, and flowing into Bideford Bay. Length 50 m.

Taxation is that branch of political economy which endeavours to explain the mode in which the revenue required for the public service may be most advantagously raised.

be most advantageously raised.

General principles of laxation.—

The majority of economists of the last century set out by an enumeration of the four classic canons or maxims of Adam Smith. They are,

bute towards the support of the Government as nearly as possible in proportion to their respective abilities. 2. Taxes should be certain, not arbitrary. 3. Taxes should be levied at the time at which it is most convenient for the contributor to pay them. 4. A tax ought to be so con-tributed as both to take out and keep out of the pockets of the people as little as possible over and above what it brings into the public treasury of the State. It is obvious that no Government with any regard to the cost of collection could possibly undertake to secure such an equality for each individual as distinct from each class of individuals, and the most that can be done is to take classes in the aggregate, determine what kind of tax presses least hardly on the different classes, and, in the case of imposts laid on all, to lessen the burden by graduation, abatement, proportionate percentage, or some other means of equitable adjustment. In spite of Mill's criticisms, the opinion that a tax in the shape of a given fraction of a small income is a heavier burden than the same fraction deducted from a much larger income, Mr. Gladstone adopted the principle of abatement, and in renewing the income tax in 1860 exempted all incomes below £100 and taxed higher incomes on the excess above £60. (Bentham first advanced the principle of leaving a certain minimum of income sufficient to provide the necessaries of life untouched.) (For the present system of exemption and graduation, the differentiation of rates in the case of uncarned income, and the imposition of supertax, see under INCOME TAX.) Mill allowed that some taxes which violated the maxim of equality might none the less be justifiably imposed, and Mr. Lloyd George's increment value duty has at least the respec-table weight of Mill's opinion that the increase of the rent of land from natural causes is a fit subject of peculiar taxation (see Increment and LAND TAXES). The present tax on undeveloped land, of course, violates the rule countries and forms. the rule sometimes put forward (e.g. by Ricardo as an objection to legacy duties) that taxes should fall on income and never on capital—a rule to which Mill himself attached not the slightest importance, seeing that all taxes were in some sense partly paid out of capital, and that in a country where wealth was abundant such taxes did not sensibly impede the increase of national wealth.

briefly stated, as follows: 1. The ad radorem duties on certain imported subjects of a State ought to contri-commodities instead of duties of a fixed money value (Fawcett, Political Economy). Fixed duties, too, are more in keeping with free trade principles, especially as those imprinciples, especially as those imposed on commodities, the quantity and price of which vary according to climatic or other conditions, must necessarily tend to discourage production. Adam Smith's third duction. Adam Smith's third maxim is commonly assumed to be observed in the ordinary course of commercial dealing thus: The wholesale merchant pays the duty in the first place if the commodity be a dutiable import, or the retailer pays for foreign goods by means of nego-tiable instruments to cover both the wholesale price and the duty, the amount of the tax being ultimately borne by the consumer. But in point of fact the consumer's convenience is not directly considered by the Legislature; he must, if he does not choose to dispense with any particular dutiable article, pay the market price for it and console himself with the reflection that in theory the majority of the electorate is in favour of the tax. Most economists in the past and many latter-day economists confidently assert that taxes on rent and taxes on real profits can-not be transferred. No doubt the occupier of land can, if he pays the property tax, deduct it from his rent, but it is a moot point whether land taxes (whatever may be their immediate operation) in almost any shape or form do not, in a country where land is limited, result in increased rentals. The vehement stirred up in some quarters by Mr. Lloyd George's undeveloped land duty may have been due to the fact (if so) that here at last was an impost which could not be shifted even on to the purchaser in the open market into whose hands the duty operated to throw many an estate. Taxes on raw material transgress Adam Smith's fourth rule, for they add to the cost of production in the first stage of the industrial process, and by increasing the capital needed for supplying the commodity in question, accumulate a charge on the consumer. the utility of bonding houses, wherein goods may remain until actually sold, and the payment of duty post-poned till that time, the result being that the consumer avoids payment of the interest on the duty as well as on the original cost of the goods. The T. of raw material has, ever since the repeal of the Corn Laws, met with the almost unanimous reprobation of economists, even those of the The second of Smith's maxims is in protectionist school. But it has effect violated by the imposition of required all the ingenuity of the

phleteer to assure the electorate that the protagonists of Tariff Reform (q.v.) have no intention (if that be so) of taxing raw material (including in that term food required for the maintenance of productive labour). Finally, in connection with Adam Smith's fourth rule it is to be added that the cost of collecting taxes should be as low as possible, as a corollary of which it follows that the articles chosen for taxation should be such that the cost of collection is not out of all proportion to the revenue yielded by the tax.

Direct and indirect taxation.-Adopting the orthodox point of view. a tax is said to be direct when it is imposed on the incomes or property of individuals; indirect when it is imposed on the articles on which such incomes or property are ex-Mill expresses the distincpended. tion as follows: 'A direct tax is one which is demanded from the very persons who it is intended or desired should pay it. Indirect are those which are demanded from one person in the expectation and intention that he shall indemnify himself at the expense of another, such as excise or customs.' It is difficult to say who really bears the burden of a tax on rent, though all such taxes are commonly assumed to fall upon the landlord. (See also under PUBLIC REVENUE.) The current division into direct and indirect taxes, for what it is worth, places in the first category taxes on rents, profits and wages; certain stamp duties, such as those on insurance, bills, notes and drafts (all of which are taxes on income generally); stamps on deeds, on probates of wills, on legacies and successions, together with all assessed taxes, such as carriage licence duties and dog tax (all of which are taxes derived from property). Excise and customs from property). duties are the only taxes commonly included in the second category. Poor rate, in so far as levied on land, is borne by the landowners; in so far as levied on trade premises, it is borne by the consumers of the articles manufactured on such premises. Each system of T. has had powerful advo-A large revenue is easily cates. collected under a system of indirect T., and, when the tax hits only a few commodities, all of which are widely consumed, the machinery of

Conservative press of to-day and the luxury involve expense in collection. strenuous assertions of the pam-But, on the other hand, direct taxes, phleteer to assure the electorate that especially if limited to profits on capital and upon all kinds of capital, are perfectly just. The modern tendency is to transfer burdens from indirect to direct taxation, a tendency which up to 1880 was the natural development of British finance. Mr. Lloyd George's highly controversial Budget of 1909-10 revived .t it selected f azation only baa tobacco. burdens on unearned and large incomes, upon monopolies in the form of licences, and upon the larger landed estates. In 1840 the proportion of indirect to direct T. was as 73 to 27, in 1870 61 to 39, in 1880 50 to 40, in 1895 52 to 48, and in 1906 the proportion was equal. Related to the incidence of T. is one of the most insistently repeated arguments in favour of protection, namely, that the cost of protection is not borne by the consumer. The merits of the fiscal controversy cannot appropriately be even touched unon in this article (see FREE TRADE, MER-CANTILE SYSTEM, PROTECTION, TARIFF REFORM, and also Customs Duties). See also Imports and EXPORTS.

Taxation of Costs, see Costs.
Taxation of Land Values, see LAND

TAXES. Taxidermy, the art of preparing the skins of vertebrate animals so as to reproduce their lifelike appearance and characteristics as nearly as possible. The art began to be practised in the 16th century, and the Sloane collection, which formed the nucleus of the natural history collection at South Kensington, was made in the early 18th century. Skinning must be done with great care, as if the skin is flayed off there is great diffioulty in restoring its proper propor-tions. A bird is opened under the wing. If opened on the breast, the bowels may be out into, and a white breast spoiled. After the body is removed measurements are taken. removed measurements are taken. While the skin is inside out it is painted with a preservative soap; Mr. Montagu Browne recommends the following: Whiting or chalk, 1½ lb.; white windsor soap, ½ lb.; chioride of lime, ½ oz.; and tineture of musk, or eucalyptus oll, ½ oz. In making a skin, the head is filled with tow before being turned through the rew commodules, an or which are making a skin, the feed is filled with widely consumed, the machinery of tow before being turned through the collection is simple and inexpensive; heavy as possible out of the pockets of the people over and above what it yields in the shape of public revenue. Conversely, direct taxes on articles of 'Setting up' may be done by wiring and filling in with cotton wool or tow. This is known as the 'soft-body' method. The 'hard-body 'method is that of using a carved-out body of cork. A more modern method is to retain the skeleton, and after freeing it from flesh and washing it with carbolic acid, to work over it with tow or clay to produce a shape like that of the body. Another method, with larger birds and most mammals, is to prepare a mould of plaster by arranging the hardened carcase in a suitable When the mould is dry paper casts are made by pressing a series of layers of paper into the mould, so that when the model is properly mounted and prepared the skin can be drawn over it. After setting up the specimen is painted over with a solution of 50 grains of bichloride of mercury in a pint of methylated spirits of wine, as a protection against the ravages of insects. With the exception of grasses, mosses, and dried leaves, real natural objects should be excluded from the ' mounting,' as they are almost certain to harbour insects. The highest art of the taxidermist falls with fishes, for shrinking and shrivelling of the skin cannot be avoided. A more satisfactory method is to take a cast as soon as possible after capture, and make an exact model in plaster. See Montagu Browne, Practical Taxidermu.

Taxing Master, see Costs.

Taxodium, a genus of deciduous conferous trees. T. distichum, the deciduous cypress, is a tall tree often grown in Britain, bearing cones about the size of a walnut; the trunk is usually very thick and the base is often swollen, while knees or hollow protuberances rise from the roots when the tree grows in swampy soil. The timber is of considerable value. Other species include T. helerophyllum, the Chinese water pine, and T. mucronatum.

Taxus, see YEW. Tay, a riv. and firth of Scotland. It rises on the borders of Argylishire in the Grampians, and flows first of all in a N.E. direction and then at the confluence of the Tummel in a S.E. direction. It flows through Perthshire and its estuary forms the division between the countles of Forfar and Fife. Its chief tributaries are the Tummel, the Bran, the Almond, and the Earn. The Earn only joins it at its estuary. The total length of the river, including the other states. ing the firth, is 115 m. It is crossed at Dundee by the famous T. Bridge. The chief port is Dundee, but shoals at Dundee by the famous T. Bridge. e.g. Hannah Thurston, 1863, and The chief port is Dundee, but shoals critical essays, notably Studies in prevent navigation to this port being very good. The river, however, is navigable as far as the town lish mathematician, born at Edmon-

of Perth. The total area of the T. basin is nearly 2500 sq. m. It is famous as a salmon river, the annual value of the salmon caught being about £50,000.

Tayabas: 1. A prov. of Luzon Is., Philippines, forming an isthmus

between the two parts of the Island. Grain is the chief product. Cap. Lucena. Pop. 153,000. 2. A tu. of the prov. of Tayabas, 63 m. S.E. of

Manila. Pop. 14,740.

Tay, Loch, one of the lochs which are found in the course of the R. Tay. It is situated in Perthshire not very far from the source of the river and before the river joins the Tummel. Other lochs in the course of the same river are lochs Dochart, Lydoch, and Rannoch.

Taylor: 1. A bor. of Lackawanna co., Pennsylvania, U.S.A., 3½ m. S.W. of Scranton, engaged in the manufacture of silk and in coal-mining. Pop. (1910) 9060. 2. A city of Williamson co., Texas, U.S.A., 35 m. N.E. of Austin. Chief products are dairy produce.

cotton and (1910) 5314.

Taylor, Alfred Swaine, M.D., F.R.S. (1806-80), a medical jurist, born at Northfleet, Kent. He was a student at Guy's and St. Thomas's, and, having spent some time in travel, was appointed professor of medical jurisprudence at Guy's in 1832, a post he held until 1870. His works include: A Manual of Medical Jurisprudence, 1844; The Principles and Practice of Medical Jurisprudence, 1865; Poisons in Relation to Medical Jurisprudence and Medicine, 1848.

Taylor, Bayard (1825-78), an American author, born in Pennsylvania. He was apprenticed to a printer, but in 1844 set sail for Liverpool and spent the next two years in travel, the result of which appeared in his Views Afool, or Europe seen with Knapsack and Staff, 1846. He went to Mexico, and published a book of travels entitled El Dorado, or Adventures in the Path of Empire, 1850. He next visited Egypt, Asia Minor, India, Hong-Kong, China, and Japan, and recorded his journeys in A Journey to Central Africa, 1854; The Land of the Saracen, 1854; and A Visit to India, China, and Japan, 1855. His narrative poem, Lars, and Northern Tennel appeared as a result Northern Travel appeared as a result of a visit to Sweden, Denmark, and Lapland, but his reputation as a poet rests upon his translation of Goethe's Faust, one of the finest attempts of its kind. Taylor also wrote novels,

ton, Middlesex. T. entered St. John's College, Cambridge, in 1701, and took degree of LL.B. in 1709. He became a fellow of the Royal Society in 1712, and its secretary in 1714, and the same year took his degree of LL.D. In 1716 he went to Paris, and had an enthusiastic reception from the French savants. He returned to England in 1717, and resumed his study, but was forced by declining health to resign his secretaryship in 1718. T. contributed able papers on higher algebra, dynamics, and general physics: His Methodus Incrementorum was published in 1715, and a Treatise

algebra, dynamics, and general physics. His Methodus Incrementorum was published in 1715, and a Treatise on Linear Perspective in 1719.

Taylor, Sir Henry (1800-86), an English dramatist. He was a contributor to the Quarterly Review when he was twenty. In 1824 he, through the influence of Mr. Henry Holland, was appointed to the Colonial Office. He devoted his leisure to writing, and in 1828 produced a tragedy, Isaac Comnenus, which was a failure. This was followed by Philip van Artevelde (1834), which was a great success. In recognition of his official labours, T. was in 1869 created K.C.M.G. His Aulobiography, privately printed in 1877, was published in 1885.

Taylor, Isaac (1759-1829) an English engraver and author, the son of Isaac T. (1730-1807). Having been brought up in his father's studio, he engraved plates for Boydell's Bible and 'Shakespeare,'as well as the 'Assassination of Rizzio 'after Opie, and a set of designs for Thomson's Seasons, etc. He published Specimens of Golhic Ornaments selected from the Parish Church of Lavenham, 1796, and a series of children's manuals.

Taylor, Isaac (1829-1901), an English philologist, born at Stamford Rivers, and was the son of Isaac T. (1785-1865). His chief work was The Alphabel, an Account of the Origin and Development of Letters (new ed., 1899), but he also published Greeks and Goths: a Study on the Runes; Elrus Family Pen; and Leaves fre book. He witon, Yorkshir, became canon of York, and two

years later dean.
Taylor, Jane (1783-1824), an English writer for children, was the daughter of Isaac T. (1759-1829). She published with her sister Ann (1782-1866) Original Poems for Infant Minds; Rhymes for the Nursery; and Hymns for Infant Minds; and separately, Contributions of Q.Q., and Display, a Tale for Young People. She was much admired by Browning and Sir Welter Scott.

Taylor, Jeremy (1613-1667). divine, was educated at Cambridge University, and took holy orders in 1634. Shortly afterwards, deputising for his friend Ricden, divinity lecturer at St. Paul's, his sermons attracted the attention of Laud, who interested himself in the young man, and sent him to Oxford, where he was elected to a fellowship at All Souls in He became chaplain to Laud 1636. and shortly after was appointed one of the King's chaplains. There were rumours that he might go over to Rome, but his famous 'gunpowder treason' sermon (1638) disposed of them for good and all. In 1643 he was made rector of Overstone, and two years later was taken prisoner by the Parliamentary forces at Cardigan Castle. He settled at Gordon Grove. Carmarthenshire, and wrote his well-known works, The Liberty of Prophesying (1646), Holy Living (1650), and Holy Dying (1651). After the Restoration he was appointed Bishop of Down and Connor, and was also made 'administrator' of the diocese of Dromore; but his desire for an English bishopric was never gratified. though his claims for such preferment were incontestable. He was one of the most literary of churchmen, and his books are still regarded as among the masterpieces of theological literature, Holy Living and Holy Dying, in particular, having run through many editions. His works were first col-Reginald Heber, and there has been a later edition by Eden (1847-1852). The Poems and Verse Translations were edited by Dr. Grosart (1870). There is a biography by Heber (1899). (1822)

Taylor, John (1580-1653), commonly called the 'Water-Poet,' was born at Gloucester. He achieved notoricty by a number of eccentric journeys, notably the voyage from London to Queenborough in a paper boat, described in The Praise of Hempseed, and the journey from

His penser

Society, 1868-78.

Taylor, John (1704-66), an English classical scholar, born at Shrowsbury. He took orders and was made canon of St. Paul's in 1757. He published editions of Greek authors with notes on Attio law; Marmor Sandvicense, a commentary on the inscription on an ancient marble; and Elements of Ciril Law.

Taylor, John James (1797-1869), an English Unitarian divine, born at Newington Butts, Surrey. He was made professor of ecclesiastical history at Manchester New College in publications are numerous.

Taylor, Nathaniel William (1786-1858), an American Congregational minister, born at New Milford. Con-necticut. Having graduated at Yale, he became, in 1812, pastor of the First Church of New Haven, and in 1822 professor of theology at Yale. His 'New Haven theology,' long regarded as heretical, maintained the doctrine of natural ability and denied total depravity. His works were and published edited bv Porter, 1858-59.

Taylor, Peter Alfred (1819-91), an English Radical politician, born in London. A silk mercer, he first became known in public life as a friend of Mazzini and of the Young Italy party, but he entered Parliament in 1862 as member for Leicester. He represented the Manchester school, and were also as a few party of the risperse of and was also one of the pioneers of international arbitration.

Taylor, Philip Meadows (1808-76), an administrator and novelist, born at Liverpool. Being sent to Bombay he accepted a post in the service of the Nizam, and after the Mutiny was appointed by the British Government in charge of some of the ceded districts of the Deccan. He was the author of brilliant novels describing author of brilliant novels describing Indian life and history, notably: Confessions of a Thug; Tippoo Sultaun; Tara; Ralph Darnell; Seeta; and A Noble Queen; but he also wrote The Story of My Life and a Student's Manual of the History of India.

Taylor, Sir Robert (1714-88), an English architect and sculptor, was the sone of a stonemeson. The mount

the son of a stonemason. The monu-ments to Cornwall and Guest at Westminster Abbey and the figure of Britannia in the centre of the prin-cipal façade of the old Bank of England are his work, but in his later years he abandoned sculpture for architecture. He built many country houses, and Stone Buildings, Lin-coln's Inn, and in 1776-81 and again in 1783 he was appointed architect to the Bank of England, and made additions to that building.

Taylor, Rowland (d. 1555), an English Protestant martyr, born at Rothbury, Northumberland. He became chaplain to Cranmer in 1540, and incumbent of Hadleigh, Suffolk, in 1544, becoming archdeacon of Exeter in 1552. He was one of the first to suffer martyrdom in Mary's reign, and was celebrated as the

ideal of a Protestant parish priest.

Taylor, Silas, alias Domville (1624-78), an English antiquary, born at Harley, Shropshire. He served in the Harley, Shropshire. He served in the Taylorville, the cap. of Christian Parliamentary army as captain, and co., Illinois, U.S.A., 26 m. S.E. of

1840, and professor of theology in later, in 1660, acted in the capacity of 1852. In the next year he was made commissary for ammunition under principal of the London College. His Sir Edward Harley at Dunkirk. He published The History of Garelkind. 1663.

Taylor, Thomas (1758-1835), an English writer, generally called 'the Platonist,' born in London. He published translations of the Orphic hymns, Plato, Aristotle, Proclus,

Porphyry, Apuleius, Pausanias, etc. Taylor, Tom (1817-1880), an English dramatist, born at Bishop Wear-mouth. He was called to the bar but devoted himself principally to journalism, contributing to numerous papers, including *Punch*, of which he was editor in succession to Shirley Brooks from 1874 until his death. Among his books was a work on Leicester Square (1874), but he is best remembered as the author of a poor play, Our American Cousins (1858), in which Sothern made a great success in England and America. Taylor, Walter Ross (1838-1907), a

Taylor, water Hoss (1838-1907), a Scottish ecclesiastic, born at Thurso. He was minister of the Free Church at E. Kilbride in 1862, being translated to Kelvinside Free Church, Glasgow, in 1868. He played a leading part in denominational affairs, and constituted the first General Assembly of the United Free Church.

Taylor, William (1765-1836), an English man of letters, born in Norwich. Having met Goethe he Norwich. Having met Goethe he became an enthusiast for German literature and translated Burger's Lenore, Lessing's Nathan, Goethe's Iphigenia, and four of Wieland's Dialogues of the Gods, but his great work was his Historic Survey of German Poetry, 1828-30.

Taylor, Zachary (1784-1850), the twelfth president of the United States, born in Orange co., Virginia. He entered the army in 1808, and in 1812 was placed in command of Fort

1812 was placed in command of Fort Harrison on the Wabash, which he successfully defended against the Indians. In 1832 he fought in the Black Hawk War, and in 1836 went to Florida and defeated the Seminoles at Okeechobee Swamp. After the annexation of Texas he resisted the Mexican invasion, winning the battles of Palo Alto and Resaca de la Palma and seizing Matamoros and Monterey, and later gained the memorable victory over Santa Anna at Buena Vista in 1847. On his return he was nominated for the presidency by the White Hall and lateral for the presidency by the White Hall and lateral for the presidency by the White Hall and lateral for the presidency and lateral for the presidency by the White Hall and lateral for the presidency and la by the Whigs (1848) and elected, just at the time when the struggle over the extension of slavery had begun. and various other party questions were rife, but he died during the Compromise of 1850.

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th. in the co. of Fife, Scotland, on the shore of the Firth of Tay, 3½ m. E.S.E. of Dundee. Pop. (1911) 3273. Tayug, or Tayud, a pueblo in Pandayana Tayud, and Dhilinning Is

gasinan prov., Luzon, Philippine Is. Pop. 11,000.

Tchad, Tchernigov, Tchira, Tchelyuskin, and Tchelyabinsk, see CHAD, CHERNIGOV, CHIRA, CHELYUSKIN, and

CHELYABINSK. Tchaikovsky, Peter Ilich. TSCHAIKOVSKY

Tchebichev, Pafnuti Luovitch (1821-94), a Russian mathematician. was born at Borovsk, in the prov. of Kaluga, and occupied the chair of mathematics in the University of St. Petersburg from 1859 to 1880. invented various mathematical instruments, including a link-work machine for producing straight-line motion.

. Tcherkask, a dist. in the territory of the Don Cossacks. The cap. is Novo-Tcherkask, about 910 m. S.S.E. of St.

Petersburg.

Tcherkesses, see CIRCASSIA.

Mikhail Gregorjovich Tchernaiev, Mikhail Gregor (1828-98), a Russian general. He prominent first in became Crimean War. In 1865 he reduced Tashkend. He retired in 1874, and for some time edited the Russian journal Ruski Mir. He took over the command of the Servian army, but in 1879 he was involved in political difficulties and sent back to Russia. For some years (1882-84) he was governor of Turkestan.

Tchernavoda, a tn. of the Dobrudja, Roumania, on the Danube, 32 m. W.N.W. of Kustendje.

Tchernigov, the cap. of the gov. of Tchernigov, Russia, on the Desna.

Pop. 27,000.

Tchernyshevsky, Nikolai Gavrilovitch (1828-89), a Russian author, born at Saratov. He was arrested in 1862 as a propagator of Nihilism and condemned to exile in Siberia in 1864. His novel, What's to be Done? was written in prison, other works from his pen being the translation into Russian of Adam Smith's Wealth of Nations and Weber's History of the World.

Tchikhatchev, Peter Alexandrovitch (1812-90), a Russian geographer and geologist. He was born at Gatchina, prov. of St. Petersburg, and became an attaché to the Russian embassy in Constantinople in 1842. While holdmg that position he made several journeys through the Turkish dominions, and recorded his observations in a series of geographical and geological books.

Tohirpan, a tn. in Eastern Rumelia, rymal gland. Sec EYE.

Springfield. Chief manufs. paper and Chemicals. Pop. (1910) 5446. Pop. 12,000. Tayport, or Ferry-Port-on-Graig, a Tea, a beverage used since a remote

period in China, but unknown in England until 1645, when it was introduced by the Dutch. Though it at once attracted great interest, it was only obtainable by wealthy people until about 1750. At first it was infused and kept in barrels, being drawn like beer, and warmed for use. In 1660 a tax of 1s. 6d. was imposed per gallon of liquid tea, but in 1680 a tax of 5s. per lb. was substituted. Since 1852, when the tax was 2s. 24d. per lb., it has been down to 4d. in 1890, and is now (1913) 5d. The consumption in Britain is about 300,000,000 lbs. per annum; of this about two-thirds is Indian T. The first shipment of Indian T. was made from Assam in 1836. T. is derived from Thea sinensis, which grows wild in Assam, and was probably intro-duced from there by the Chinese. The young leaves and shoots, or 'flushes,' are picked from the bushes by women and children. After gathering, they are spread thinly over wire or bamboo trays, and placed in a large house in a temperature of about 80° for two days to wither, when they can be rolled without breaking. This process causes the juice to be exuded, and it is still performed manually in China, though large and hygienic rolling machines have been introduced. The leaf is then spread out thinly on the floor of a fermenting room, where the air is kept moist, and there in a few hours it changes from a green to a copper colour. It is then 'fired' by being spread out on trays and carried through a hot-air chamber. being sorted or classified, a process carried on in modern plantations by machinery, the T. is again ' fired ' and then packed for export. In making T. the water should be fresh and freshly boiled, and after pouring over the T., should be allowed to stand for three to five minutes, when the T. should be poured off the leaves. Ts. costing up to 1s. 8d. per lb. should make about 220 cups to the lb., while more expensive Ts. make about 280 cups. There are many other methods of using T., and a gargle of T. is strongly recommended for sore throat.

Teachers' Guild, an association of teachers in all branches of the educational profession in the Its aim is to promote the empire. interests of the profession as a whole without regard to grading distinc-tions. Among its activities is the promotion of holiday courses for British various continental teachers at. contres.

Tears, the secretion of the lach-

Technical Education, a system of in- ability, of the pupil. In the provision struction whose aim is directly utilitarian, especially in relation to productive industries. In the wider sense of the term, any branch of knowledge which is a necessary preliminary to any particular profession or trade is technical, such as the instruction received by medical students, law in connection with the legal profession, the principles of art as studied by artists with a view to their application, etc. For administrative purposes, however, the term is practically restricted to instruction which is calculated to render workmen, foremen, managers, clerks, and others more competent in fulfilling duties in their Formerly, particular industries. technical instruction was received in the course of apprenticeship; the young workman was directly under the eye of his master, and was taught the details of his trade during actual Many causes have working hours. combined to break up the old institution of apprenticeship, among which may be mentioned the specialisation which has divided many industries into small branches, rendering acquaintance with the industry as a whole difficult to achieve by a person actually engaged in the work, and the modern tendency to 'efficiency' in organisation which makes it difficult to find a place for a person who is at once pupil and workman. It is accordingly found a more useful plan to instruct the would-be worker in the principles underlying his work before he begins to practise them, or, in the case of actual workers anxious to improve their position, to provide for instruction in the evenings after work The growing complexity of many industries demands that efficient technical instruction should be provided so as to commence at a fairly early age, and there is a tendency for the claims of technical education to contend with those of general education to the detriment of the latter. There is consequently a wide-spread desire to force into the school curriculum subjects which are calculated to prepare the pupil in a practical manner for his life-work as artisan. Fortunately, the administrations of most modern countries have decided that up to the age of about fourteen, the chief aim of all instruction should be a broadening of outlook, the provision of a mental and physical equipment which shall prepare the pupil to play an enlightened part in all the varied activities of life. After the age of fourteen, it is very generally conceded that instruction may be specifically technical, or may serve the ends of a higher general education at the option, or according to the

of technical instruction the following principles are generally observed by modern states. The state itself has a responsibility to modern industry, but the carrying out of details is best left to local administrations. Special schools may be provided for definitely technical purposes, but there is no need to divorce technical from secondary education, if the local conditions are favourable to a combination. The higher branches of technical education, i.e. those that concern the future of an industry rather than the practical needs of the present, should be administered in centralised institutes by the state itself, or by universities or other bodies in direct communication with the state administration. Technical education in general should bear a relationship to local industries. In England, provision was made for technical education by the Technical Instruction Act. 1889, which empowered county and borough councils to levy a rate of not more than a penny in the pound for the support of technical instruction. By the Education Act, 1902, control of education in general was placed in the hands of county and borough councils. Day technical schools are concerned with the teaching of the principles underlying the arts and crafts, and to a certain extent provide for the cultivation of dexterity in the use of tools, etc. Evening classes are established for supplementary instruction for those already engaged in industry or commerce. The working-class pupil may thus pass from the elementary school into the technical or secondary school by means of scholarships, or may leave school and attend evening classes after his hours of labour. On the continent, however, the differentiation of secondary schools in order to provide various types of professional or trade instruction is carried further than in England, and there is a tendency to make continuation classes compulsory up to the age of seventeen. Âmerica, agricultural and trade colleges are supported by revenue from public lands, while the provision of commercial and trade schools of various types by public and private enterprise is a prominent feature of educational development in most of the states. Technology (Gk. τέχνη, art craft), the body of knowledge relating to arts and crafts.

It includes the history of the development of productive arts, the scientific principles underlying them, and descriptive accounts of processes employed in them.

Teddington, a par. and tn. of Middle-

sex, England; on the l. b. of the Thames; 2½ m. 'S:W. of Richmond. The National Physical Laboratory (q.v.) is situated in the neighbourhood. The first lock on the Thames is at Teddington. Pop. 16,000.

Tees, a riv. of England, which rises in Cross Fell, Cumberland, and flows S.E. and then N.E. through Teesdale, forming the boundary between York and Durham. After a course of 70 m. it flows into the North Sea. The tributaries are the Langley Beck and Skerne on the right, and the Breta and the Leven on the left. The river is navigable for vessels of 60 tons to Stockton.

Teeth, the calcareous structures occupying the alveolar processes of the upper and lower jaw, and serving to tear, cut, or grind food. The derivation, form, and structure of T. in different animals vary considerably. The cyclostomata are furnished with horny projections by way of T. Fishes generally have well developed T., sometimes arranged in several rows. as in the shark, whose outer T. are replaced by fresh ones from the inner rows as the old ones become worn. The sturgeon has no T. at all, but the pike is provided with a formidable complement, some of the T. being hinged, so that they are directed backwards while prey is being prey is backwards while being held, resuming a more upright posi-Amphibians tion when disengaged. generally are not so well provided with T. as fishes. The frog has none on the lower jaw, and the toad has none at all. Reptiles have usually few T.; in most cases they are fused to the bone of the jaw. Turtles have no T. Non-poisonous snakes are furnished with a few excessively curved T. for with a few excessively curved T. for retaining their prey. Poisonous snakes have special poison fangs arising from the maxilla; in some cases, as in the rattlesnake, the poison fangs are hinged. Existing birds are without T. but some fossil birds exhibit T. of reptillan form. Mammals are generally well furnished with T. of various forms which are with T. of various forms which are usually classified as incisors, canines, premolars, and molars. In man there are thirty-two permanent T., sixteen in each jaw. They are divided as follows: Two incisors, one canine, two premolars or bicuspids, and three molars in each lateral half of each jaw. The incisors have chisel-shaped crowns, and are therefore adapted for dividing food by cutting. In the upper jaw they are socketed in the pre-maxillary bone. The canine T. are conical in shape, and are therefore adapted for piercing. In carnivorous animals they pointed T., prey. The c

times two

canines ar have a single root. The molars, the largest and firmest T., are placed behind the bicuspids. Those of the upper jaw have three or four cusps, while the lower jaw molars have four or five. The upper molars have three roots each, and the lower molars two roots each. The last and smallest molar is known as the 'wisdom tooth.'
The arrangement of the T. of any mammalian species is best summed up in a dental formula. Thus the

up in a dental formula. formula for man, $\frac{2.1.2.3}{2.1.2.3}$, indicates that there are 2 incisors, 1 canine, 2 premolars and 3 molars in each lateral half of the upper and of the lower jaw. The structure of the T. of man is essentially the same in all the forms of T. The outer layer is composed of enamel, a hard substance consisting principally of calcium phosphate and smaller amounts of calcium carbonate, magnesium phosphate, and calcium fluoride. The next layer is composed of dentine which contains the same mineral substances as the enamel with the addition of organic matter. Dentine is hard, though not so hard as enamel; it forms the greater part of the bulk of the tooth, and is furnished with a series of fine channels by which communication is established between its substance, the enamel and the dental pulp. The dental pulp is contained in a cavity within the dentine. It consists of blood vessels and nervous matter. The root of the tooth is devoid of enamel, but possesses a coating of 'dental cement,' a bony layer which is adjacent to the periosteum of the alveolar cavity. The permanent T. in man are preceded by temporary or 'milk' T. These are fewer in number, walls in the area of white in adapta. smaller in size and whiter in colour than the permanent T., and they are also somewhat different in shape, the roots of the molars, in particular, being more divergent than corresponding structures in permanent T. They number two incisors, one canine, and two molars in each lateral half of the upper and lower jaw. They appear usually in the following order: the middle incisors of the lower jaw come between the sixth and ninth month after birth, the incisors of the upper jaw come next, then the remaining lower incisors, then the first molars, then the canines, and last of all the second molars. The whole process is

usually over by the end of the second year. The permanent first molar

appears about the seventh year, and of Munich, between the two rivers is followed by the permanent middle Inn and Isar. The lake is 4 m. in incisors. At eight the remaining length and has a width of about 11 m. incisors appear; then follow the premolars, the canine and the second molar at intervals of about a year between each, the second molar appearing at twelve. The third molar. or wisdom tooth, is not cut until much later, the usual age being The most common disease affecting the human race is probably dental caries. The cause of the disease is the presence of bacteria in the mouth which bring about fermentative changes in starchy or carbo-hydrate food by which lactic acid is produced. The acid disintegrates the enamel coating, after which other bacteria cause putrefactive changes in the organic matter of the dentine, leading to a breaking down of the tooth structure, inflammation of the pulp, and the consequent distressing pain known as toothache. The baneful effects upon general health resulting enects upon general health resulting from defective T. can only be successfully obviated by recourse to the methods of dental surgery. See DENTISTRY; see also C. S. Tomes, A Manual of Dental Anatomy, 1904. Teething (A.-S. toth, tooth), the cruption or cutting of the first teeth in infants. Man is provided with two sets of teeth one of which makes its

sets of teeth, one of which makes its appearance during infancy and is known as the temporary set or The eruption of each milk-teeth. tooth is preceded by swelling of the gum and increased production of saliva, and accompanied by various irregularities in the health of the child which are generally due, how-ever, to improper feeding. The tem-porary set consists of twenty teeth. There are on each side four incisors, two canines, and four molars. The middle incisors are cut about the seventh mouth after birth, the other incisors two months later, the canine at the eighteenth month, and the molars at about the first and second years respectively. Each tooth of the lower law appears a short time before the corresponding tooth of the upper T. is accompanied by restless-at night. The food should be ness at night. lessened in strength but not quantity. See W. B. Drummond, The Child (Dent & Sons), and Honnor Morten, A Complete System of Nursing (Dent & Sons).

Tegea, an ancient in. of Arcadia in Greece. In its earliest days it was closely associated with Sparta, but after 371 B.C. became independent. The town was famous for its magnificent temple built in honour of Pallas Athene (394 B.C.).

Upper Bayaria, Germany, 27 m. S.E., pleasant and well-kept gardens. It is

length and has a width of about 11 m. It is one of the most popular summer

health resorts in Europe.
Tegetthoff, Wilhelm, Baron von (1827-71), an Austrian admiral, born at Marburg in Styria. In 1848 he was present at the blockade of Venice, and commanded the Austrian contingent when the allies were victorious over the Danes at Heligoland in 1864. His most famous victory was that which he obtained on July 4, 1866, over the Italian fleet under Persano. which was bombarding Lissa.

Teggiano (ancient Tegianum), a tn. of Campania, Italy, in the prov. of Salerno, 22 m. S.S.W. of Potenza.

Pop. 5160.

Tegnér, Elof Kristofer (1844-1900), grandson of E. Tegner (q.v.); a wedish historian. He became in Swedish historian. 1883 the chief librarian at Lund. He published in 1872 Bärug till Kidnne-dom om Sreriges Yttre Politik which gives a good review of the reign of Gustavus III. In 1887 he completed his biography of Gustaf Mauritz Armfelt.

Tegnér, Esaias (1782-1846), a Swedish poet, born at Kyrkernd in Vernland. He received a good edu-cation, and in 1802 became lecturer in philosophy at the University of Lund. In 1811 he published an ode, Srea, which was crowned by the Academy. He is regarded as Sweden's greatest poet. He published in 1820 Nativardsbarnen, Axel in 1822, and in 1825 Frithiof's Saga. He established himself also as a critic of considerable ability. In 1812 he had been ordained, and in 1824 he was made Bishop of Vexic. His later rears were overshadowed by melan-cholia. See Collected Works (1882-85), and Brandes's E. Temér (1878). Tegucigalpa: 1. A dept. of the

of Honduras, Central It is an agricultural dist., Republic America. and gold and silver mines are worked. Pop. 82,000. 2. The tn. of T. is the cap. of the country, situated on the R. Choluteca. It is a well-built town, containing a cathedral, central university, law courts, national printing works, etc. It is united by a bridge to Concepcion on the opposite bank of the river. Pop. 35,000.

Tehama, the name given by the Arabs to the comparatively low-lying region on the western coast of Arabia.

Teheran, or Tehran, a city and the cap. of Persia. It stands in the centre of an exceedingly fertile plain about 60 m. S. of the Caspian Sca. The climate is exceedingly not during the summer, but mild and pleasant during the rest of the year. The city Tegernsee, a mountain lake of is typically eastern, surrounded by

the social centre of the Persian the East India Company as a cadet at nobles, and not far from here stands the mosque where the Shah Nasr-ed-Din was assassinated in 1896. The city has little commercial interests, but is the terminus of the Persian railway. In 1911, a concession was granted Russia to build another railway connecting T. to Khanikan, and a Russian railway is also to be constructed going to Batoum and T. Pop. 280,000.

Tehuacan, a tn. of Mexico, in the state of Puebla, and 65 m. S.E. there-It is noted for its mineral

springs. Pop. 7700.

Tehuantepec Winds, or Papagayos, as they are known on the Mexican plateau, are due to the same influence as the 'nortes' or 'northers,' of the regions round the Gulf of Mexico. The comparative warmth of the gulf in winter and the presence of the continental anticyclone over the central portions of N. America produce unstable conditions; in the gulf are generated cyclones which find a path along the coastal regions of U.S.A. between the high pressure over the continent and the Atlantic high pressure at its weakest. The compensating current from the N.E. is composed of cold dry winds from the continent, allied to the mistral or bora of the Mediterranean. They are strong on the Mexican coast, but weaker on the Pacific, in Nicaragua and Guatemala, where they are known as T. W. from their direction.

Tehuelches, a group of Patagonian tribes, about whose strength and stature somewhat exaggerated reports were given by early explorers. Their average height among the males is close on 6 ft., and they have often been spoken of as the tallest

race of men.

Teili, or Teivy, a river of Walcs, rising in Llyn Teifi, N.E. Cardigan-It forms the boundary tween Cardiganshire and Carmarthenshire, and after flowing 53 m. enters Cardigan Bay.

Teign, a river of Devonshire, England, rising in Dartmoor, near Chag-ford; after flowing for 30 m. it enters the English Channel at Teignmouth. Its estuary is nearly a mile across.

Teignmouth, a scaport and market tn. and fashionable resort of Devonshire, England, situated at the mouth of the Teign, 15 m. S.E. of Exeter. Its sea-wall is 2 m. in length. Pipeclay and china clay are shipped here for the S other industr

the age of eighteen. He rose rapidly in the service of the company, and was finally made a member of the Supreme Council. In 1793 he succeeded Cornwallis as Governor-General of India. He retired from this office in 1797 and received his peerage on his return to this country.

Teil, Le, a vil. and com. of France. in the dept. of Ille-et-Vilaine, 16½ m.

S.W. of Vitre. Pop. 5800.
Teinds. The T. of a Scottish par..
like the tithes of English law, are that proportion of rents or goods which goes to the maintenance of the clergy. The clergy, however, have now no right to T. beyond a suitable provision or stipend. Generally speaking. T., like tithes, are a burden on land, and most lands, except glebe lands and lands in respect of which the T. have been redeemed, are liable to such burden. According to canon law one-tenth of that which one acquires by one's own industry (personal T.) is due by divine right to the Christian clergy; but Soots law requires evidence of forty years' possession of personal T. to make good a legal right to them. Predial T. are said to be either parsonage or vicarage; the former being T. of corn due to the parson or other titular of the benefice; the latter being payable to the vicar out of cattle, lent, fowl, eggs, etc. Parsonage T., having always been an inherent burden upon all lands not specially exempt, cannot be lost by prescription; but the right to vicar-age T., having always rested upon usage, can be lost 'non utendo' (non-user). After the Reformation the whole of the T. were transferred to the Crown, or to private individuals called titulars to whom they had been granted by the Crown, or to feuars or renters from the Church, or to the original founding patrons, or to col-In the leges or pious institutions. In the reign of Charles I. it was provided by arbitral decrees (subsequently confirmed by statute) that T. (up till then payable in kind) should be liable to be valued and the landowner entitled to purchase or redeem them at a certain valuation. This obviated the inconvenience of the titular or patron of T. coming on the land at his leisure and claiming the physical separation of his tenth part after harvest (though there was an alternative method of payment by 'rentalbolls'). Landowners liable to T. may also sue titulars for a valuation or for a sale of their T. T. not so valued or redeemed are still 'drawn in kind.' malting, and mackerel being taken from the Teign. Pop. (1911) 9221.
Teignmouth, John Shore, Lord (1751-1834), entered the service of the old Court of T. Predial T. are still paid in kind. The Court of Session (q.v.) has now taken over the whole of the jurisdiction of

Teith, a river of Perthshire, Scotland, formed by the junction of two streams at Callander, which rise near the N. end of Loch Lomond. The scenery is beautiful and romantic in the upper course, and the castle of Doune stands on its banks. In its lower course the water-power is used

to work cotton-mills, etc. It enters the Forth 2 m. N.W. of Stirling. Tekax, a tn. of Mexico, in the state of Yucatan, 46 m. S.É. by S. of Mérida. Pop. 19,000.

Tekir-dagh, sec Rodosto.

Telamon, a character in ancient Grecian legend. He was the brother of Peleus, and together with him slew Phocus their half-brother. T. fled the country and went Salamis. He married the daughter of the king of that island and ultimately succeeded to the throne. He was one of the heroes of the voyage of the Argo, and took part in the adventure of Hercules when that here took Troy. He was the father of Ajax.

Telautograph, a telegraphic instrument for the transmission of sketches or written messages; the sketch or message being reproduced identically at the other end of the line. The message is written on a roll of paper by means of a pencil. The motion of the pencil is resolved into its component rotary motions, these motions controlling the currents in two separate circuits. The receiver consists essentially of two very fine coils of copper wire suspended in the field of a very strong electro-magnet. The two line currents sent from the transmitter vary the strength of the field of this electro-magnet, thus causing the coils to have a vertical motion owing to electro-magnetic action. This motion actuates a set of levers which transmit the motion to the pencil on the recorder.

Telav, an old tn. of Transcaucasia, Russia, in the gov. of Tiflis, 63 m. N.E. therefrom, on the R. Alazan. It was founded in 893 and possesses numerous interesting ruins of ancient forts, monasteries, etc.; in the near vicinity is the 6th century Ikaltoi monastery, and the neighbourhood is much frequented by pilgrims. There is a considerable export trade

There is a considerable in wine. Pop. 12,000.

Telde, a tn. in Gran Canaria, Canary Is., 7 m. S. of Las Palmas, on the E. coast. It has considerable the E. coast. I trade. Pop. 9500.

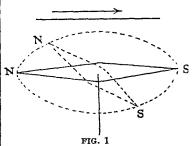
Telegonus, a son of Odysseus by When he arrived at manhood he was sent by his mother to find Odysseus. He landed on the island of Ithaca, but was attacked by his father and Telemachus, who imagined him a pirate. He slew Odysseus not knowing who he was, and afterwards l

conveyed the body to Circe for burial-He married, later, Penelope.

Telegony, see HEREDITY.

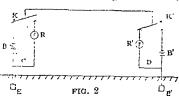
Telegraph Plant, or Desmodium gyrans, an Asiatic leguminous plant, bearing panicles of violet flowers. Its leaflets have a rotatory movement in sunlight. The plant is often grown in the stovehouse.

Telegraphy, a method of trans-mitting signals to a distant station by means of an electric current. A fairly successful but not very practicable attempt at electric signalling had been made by Morrison, a writer in the Scots Magazine. It consisted of a wire for each letter of the alphabet. At the receiving station the letter corresponding to its particular wire would lie on a sheet of paper under the end of the wire. The operator would spell out the words by manipulating the different wires, when the letters at the receiving stations would rise, being attracted by its particular wire, and thus would spell out the word at the receiving station. A somewhat similar system was invented in Geneva 1774. The discovery Oersted of the deflection of a magnetic needle out of the meridian by means of an electric current was a great advance. He found that if a wire carrying a current were held over a magnetic needle freely suspended as in Fig. 1, the needle would be deflected



to the right or left according to the direction of the current. The arrow head shows the direction of the current, the dotted needle showing the needle in its deflected position. Upon this principle many galvanometers used in electric measurements are constructed. From this discovery Wheatstone and Cooke invented in 1835 their five-needle telegraph which required only five wire lines, afterwards inventing the double-needle, and then the single-needle which required only one wire line. The oneneedle system is universally used on railways owing to its great sensitiveness, but it has the disadvantage of being a low-speed system. The in- The essential parts of the Morse revention of the electro-magnet gave ceiver consist of an electro-magnet Morse most of the requirements for and an armature at the end of a lover, the system which he invented in 1836, the other end of which parties a track

the system which he invented in 1836. The Morse System.—Fig. 2 represents this system in its simple form. Let C and D be two stations between which communication is made. Both stations are similarly constructed. B and B' represent batteries, one pole of which is earthed at E and E'. R and R' are the recording instruments.



The keys K and K¹ are normally in contact with the recording instruments, so that both stations are susceptible to signals. Consider a message being transmitted from C to D. key K is pressed to make contact with the battery B, then clearly we have a complete circuit, and battery B sends a current through the circuit. key K affords an instrument for interrupting the current in any approved fashion, and thus the recorder at D takes up the message. During this operation the recorder R is out of the circuit. Similarly a message may be transmitted from D to C by pressing the key K¹, the key K being now in contact with the recorder R. keys are actuated by springs, so that unless pressed out of position they are in contact with their respective re-corders. The code in general use is that due to Morse, which consists of two distinct signals suitably arranged in groups to stand for every letter of punctuation These two the alphabet, numbers, etc. two signals differ only in their time of duration, one being of short duration, the other long, the former representing a 'dot,' the latter a 'dash.' Fig. 3 gives the Morse Code now in general use:

B C D		L M N	 	W X	<u></u>
F G	· : ,	P	: :	Z	
I J 1	:	S T 3	<u>.</u>	7 8 9	

FIG. 3

The essential parts of the Morse receiver consist of an electro-magnet and an armature at the end of a lover, the other end of which carries a style. The attraction of the armature by the electro-magnet when it is excited causes the style to press against a roller over which a roll of paper passes, being worked by a mechanical arrangement. Figs. 4 and 5 illustrate the essential features of the receiver. Fig. 4

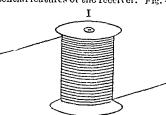
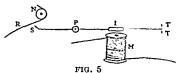


FIG. 4

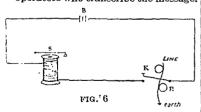
represents the ordinary type of electromagnet in use, consisting of a wooden bobbin around which is wound a large number of coils of insulated wire. It contains a central iron core, the end of which is seen projecting at I. Fig. 5 represen pivoted at P.

armature I, ti the style S. R is the roll of paper working over the roller N. When the



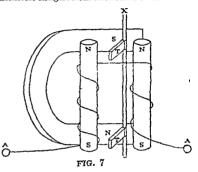
electro-magnet M is excited by the passage of a current I is attracted, and so the lever turns about P, pressing S against the paper. Immediately the current stops the attraction of I ceases and the lever springs back into its normal position. In this way by altering the direction of the current S may be kept in contact with R as long as necessary, and thus the 'dot' and 'dash' signals are written on the paper by the style, it being remembered that the paper moves across the style S with a uniform motion. The writing of the signals is not necessary to a trained operator, the tappings of the lever against the stops TT and the duration between the successive taps being sufficient to interpret the signals. This led to the development of the sounder principle, which is now in universal operation. When the sounder is worked by the line current the method is called 'direct

working.' mens and Halske was a great improvement upon the Morse receiver, owing to the greater facility effected for reading the marks on the paper. A small disc attached to the lever is rotated automatically in the opposite direction to that in which the paper moves. The disc revolves in a reservoir of ink, so that when the armature is attracted by the electro-magnet, and the disc thus raised into contact with the paper, it writes on the paper. Clearly then the length of the mark made on the paper will depend on the duration of the current working the electro-magnet. The automatic system invented by Wheatstone, owing to the high speed attainable by its use, is very largely employed in Britain and the U.S.A. this system the message is prepared on a strip of paper by a machine which perforates the paper according to the 'long' and 'short' signals of the Morse Code. This perforated strip is run through an automatic transmitter, thus effecting a control of the several parts of the apparatus which results in the required currents being transmitted to the line. This system will clearly need a large number of operators to keep the transmitter working continuously, since a large number will be required to prepare the perforated strips. The receiver consists of a standard relay, which will be described later, with a tongue carrying an ink wheel which writes on a moving strip of paper similarly to the Digney ink-writer. The paper runs through the machine at a very great speed and is divided among the several operators who transcribe the message.



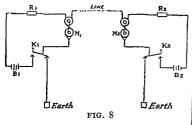
It is used chiefly in the transmission of press news, in that several perforated sheets are easily produced for one working of the machine. When the currents are transmitted over long distances, they become less strong when received, owing to the resistance of the line and leakage due to bad insulation. This difficulty is overcome by the use of a relay. The sending battery is made strong enough to work a very sensitive receiving instrument, i.e., the relay. This relay gives out no audible sounds, but the

The ink-writer of Siealske was a great improvethe Morse receiver, owing
ater facility effected for
marks on the paper. A
attached to the lever is
omatically in the opposite
of that in which the paper
edisc revolves in a reserso that when the armaacted by the electro-magedisc fus raised into conhe paper, it writes on the
arrly then the length of the
on the paper will depend



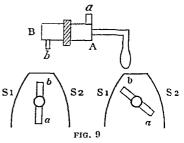
takes the form of an electro-magnet as in Fig. 4, the magnetism being caused by the passage of the line current through the coils. The absence of any permanent magnetism detracts from its sensitiveness, and thus the post office standard relay is of the In this relay the polarised variety. iron cores of the electro-magnet are iron cores of the electro-magnet are polarised by a permanent horse-shoe magnet. Fig. 7 gives an outline of the standard relay. The poles of the electro-magnet are marked in the diagram. Behind them is placed the permanent magnet with its S. pole just behind the N. poles of the electromagnets and its N. pole just behind the S. poles of the electromagnets. Between the poles are the soft from Between the poles are the soft iron tongues T attached to a brass spindle. The presence of the permanent maginduces magnetism in tongues, and hence the end of the top tongue will have a S. pole and the bottom tongue a N. pole, these poles being situated between the poles of the electro-magnet. The spindle is free to rotate, and thus the tongues may move towards the left or right when attracted by the electro-magnet. In the normal state when the electromagnet is not excited by the passage of a current, magnetic poles are induced in the iron cores by the iron tongues, the polarity being opposite

entering at A will tend to reduce this system is that due to Wheatstone polarity in one core and increase it in which depends on the Wheatstone the other, and thus the tongues are attracted to one side and cause the spindle to rotate. This spindle actuates a contrivance to close the 'local' The sensitiveness of the instrument is clearly made very high, owing to the presence of the four pole All the above systems may be pieces. made to work in both directions at the same time on only one wire by means of the Duplex Method. The The differential duplex depends on the following principle. Suppose an iron core is wound by two wires of equal



resistance, in opposite directions, each wire being connected to a battery. If the current supplied by each battery is equal in value, their magnetic effects on the iron will neutralise each other and the electro-magnet will remain unmagnetised. If the currents are not equal, amount of magnetisation product will depend on the difference of the two currents. Fig. 8 shows how this principle is applied in working. The stations are numbered 1 and 2, the corresponding parts having numbers as suffixes to the letter denoting the part. The circuit after leaving the key K, divides into two parts, one wire going round the electromagnet M, in one direction through the resistance R1, which is equal to the line resistance, back to the battery. The other wire winds around M1 in the opposite direction and connects to the line wire and thence to the second station, where the arrange-ments are similar. If only one station is transmitting, then since R, and the line resistance are equal M, is unaffected, and since only one wire of M, is closed, then the receiving instrument will be affected. If both If both stations work together, since the resistances of both stations are the same, when both keys are depressed, clearly the currents in the line wire annul each other, the receiver in each station then being worked by the currents through R₁ and R₂, these currents being called the compensating

bridge principle. If a double-current sounder be utilised and the above employed, the resulting system may be made quadruplex, i.e., eight operators may be at work on one line, four transmitting and four receiving. Multiplex working admits of six messages being transmitted simultaneously on the same line. Other systems are in use which employ two signals which differ from one another by their positions. It has been noted that when a current flows in a coil of wire, a needle placed on the axis of the coil will be deflected. Consider an ordinary galvanometer: When the current is sent through the coils, the needle will be deflected to the left of the observer, say. When the current is reversed, the needle will be deflected to the right. These two positions correspond to the 'dot' and 'dash' of the Morse Code, the left-hand position for the 'dot' and the right-hand for the 'dash.' The receiving The receiving instrument is very similar to this single needle galranometer. This receiver has the disadvantage that the operator has to read both the signals and his own writing at the same To surmount this difficulty, the needle is made to strike against two metallic plates, one on each side; sometimes a double-sounder principle is employed, which gives not only the different positions, but also a different sound, corresponding to the different positions. It will be observed that a double current is necessary to



actuate the needle. The drop-handle form is the one generally used with this type of instrument. The handle, work together, since the se of both stations are the len both keys are depressed, he currents in the line wire the other, the receiver in each then the positive pole of the battery being connected to A and the negative pole to the there, the receiver in each to A and the negative pole to B. S, and S, are steel springs, a and b rest ough R, and R, these curing called the compensating Another important duplex

is moved to the right, say, b makes France. contact with S2 and a with S1. handle is moved to the left, a makes contact with S2 and b with S1, and thus by moving the handle to right and then to the left the direction of the current can be reversed. This type of instrument has largely gone out of use; it is now chiefly employed on railways. This method is, however, employed in signalling through long submarine cables. These cables act like condensers, and thus the currents which are sent into the line quite distinct from one another flow into each other before they reach the receiving instrument, and would require such a very high electro-motive force to actuate the instruments at the end of a long cable that the safety of the cable would be to a large degree sacrificed. The results of the cable would be to a large degree sacrificed. flecting galvanometer introduced by Lord Kelvin indicates a signal when there is the slightest variation in the The signals are produced by a double-sending key as described in Fig. 8. The reflecting galvanometer has now been replaced by the syphon recorder. This instrument is made very similarly to the D'Arson-val galvanometer. It consists essentially of a movable coil which is capable of oscillating between the two poles of a permanent magnet. reversed signals are received the coil oscillates and by means of a thread causes a corresponding movement in This syphon consists of the syphon. a thin glass tube, one end of which dips into a vessel containing ink, while the other touches a strip of paper, it being so arranged that this end is free to move across the strip of The oscillations of the coil cause the syphon to vibrate, and the ink is thrown on to the paper in small dots. As the paper is made to travel onwards, the syphon will trace out a curve, and thus the movements of the coil will be recorded. The electro-magnetic alphabetical telegraph of Wheatstone is largely used in Britain. It consists of a large number of keys arranged on a circular dial, each key corresponding to a letter, punctuation mark, etc. The receiving instrument consists of a pointer which can rotate over the face of the dial having letters, etc., printed on its face. This pointer moves from letter to letter by steps, the motion being regulated by a ratchet motion. This motion is banks.

This consists of a large If the number of keys, each corresponding to a letter, etc.; the depression of any particular key causes a type wheel to record the letter, etc., at the receiving This recorder differs from that of Wheatstone in that the Wheatstone is non-recording, whereas the Hughes machine records the message. Further, the Hughes machine admits of duplex working. telegraphs have not come into great use, owing to their very low working speed. Two line wires are required; the sender writes with a stylus and this causes variations in the resistance of the instrument. This variation causes a corresponding variation in the strength of a permanent current flowing in each line, which gives rise to differential magnetic action at the receiving station and so actuates a writing pen to record the signs on a strip of moving paper. The action of instruments which transmit writing, diagrams, etc., depends upon electrolytic action. At the sending station the writing is placed on a sheet of tin foil in insulating ink. This sheet is placed on a rotating cylinder, n metallic stylus connected to the line being in contact with it, and also connected to one pole of a battery, the other pole being connected to the tin foil and the earth through the cylinder. The receiving instrument is similar in construction, the actual receiving part being a piece of damp chemically prepared paper. Both the sending and receiving cylinders rotate together with the same When the stylus moves on the tin foil, the shunt circuit through the stylus and tin foil operates, and there is no current in the line, but when the stylus moves on the insulating ink, the shunt circuit is cut out and the current passes through the line to the writing pen and hence through the damp paper. Electrolytic effects the damp paper. Electrolytic effects are thus produced and the writing marked on the paper.

Telegraph Lines.—The open lines

have been most generally used, owing to their lower cost, better electrical condition, and being more easily accessible than cables which are placed underground. The open lines consist of bare iron or copper wire suspended from wooden poles by the side of railways, roads, and canal banks. In large towns the choice worked by the armature of an electro-lies between overhouse or undermagnet which is actuated by the current which is actuated by the sender. By depressing one of the keys, the sending also the lines must be placed about operator cuts off the current until that 40 ft. high when crossing over key is again raised. In this way the message can be spelt out at the receiving station. Hughes' recorder is still largely used on short cables and in buried underground in pipes or led

through railway tunnels or other sub-place. For an increase in the num-ways. On open lines each end of the ber of lines of force the current flows wire is bound at the support to an in- in one direction, and for a decrease it sulating cup generally made of porce- flows in the opposite direction. Conlain. In drier atmospheres that of Britain glass is sometimes used. The supports consist wooden poles, preserved by some chemical process; to these wooden poles an iron wire is fixed from the ground to above the 'roof' and branching off to the various arms on which the insulators are fixed. wire is used to minimise lightning effects and for carrying stray currents to the earth. Iron poles are used in tropical countries owing to climatic conditions, transportation difficulties. and the attack of insects.

For Submarine Cables, see Cables. See Preece and Sivewright, Text-book of Telegraphy, 1910; Herbert, Telegraphy (British Post Office System), 1907; Bright, Submarine Telegraphy.
Telegraphy, Wireless, see WIRELESS

TELEGRAPHY, and Electricity-

Electro-magnetic Waves.

Telemachus, the son of Odysseus and Penelope. Left as a child when his father set out for the war with his father set out for the war with Troy, after his father's absence had lasted for about twenty years he set sail in search of news of him. He visited Pylos and Sparta, and returned to Ithaca in time to help his father in the famous fight with the suitors. He succeeded Odysseus as Time of These (Homer's Odyseus) King of Ithaca. (Homer's Odyssey.)

Telemeter, see Rangefinders. Teleology, see KANT and HEGEL. Teleosteans, or Teleostei, see BONY

FISHES.

Teleosaurus, a marine genus belonging to the family Teleosauride, of the crocodile order (class Reptilia). It is readily characterised by the teeth being inclined horizontally outwards, and is confined to the Lower Jurassic beds.

PSYCHICAL RE-Telepathy. see

SEARCH. Bells, seeTelephone

ELECTRIC BELLS AND ALARMS.

Telephony, a system of producing sounds at a distance by the agency of The system was invented electricity. by Graham Bell (1876). The essential parts of the system consist of a receiver, line wire, and a transmitter. The transmitter and receiver are similar in construction, their action depending on the phenomena In the electro-magnetic induction. article on electricity it has been pointed out that if a coil of wire be placed in a magnetic field, any change in the strength of that field or any chauge in the number of magnetic lines of force through the coil pro-duces a current in the coil which lasts

than sider the bar-magnet NS and a piece of soft iron P held near one of its t of poles (Fig. 1). The introduction of P produces a re-arrangement of the lines of force, the lines tending to go through P rather than through the surrounding air. Any movement of P towards S will cause more lines to

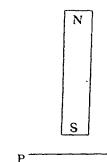
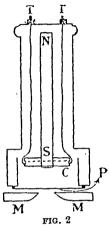


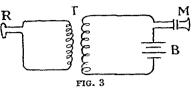
FIG. 1 go through P, while if P moves away from S less lines will traverse P. S and onil of ٠... wire, II thus produ in the by a coil. placed with regard to a bar-magnet and plate, these currents flow to this coll. The currents thus tend to increase or decrease the polarity of this second magnet according to the direction of the current. If the current is alternating the increase and decrease also alternate, and thus the second plate is made to execute a vibrating motion similar to the first. Sound consists of a wave motion in the air; if these sound waves fall on the plate P they cause the plate to vibrate, this vibration and its resulting electrical effects, as indicated above, cause the second plate to vibrate similarly, and thus sound waves are given out at the receiving end, which are heard by the Modern operator. telephone struction, although obeying the above principles as fundamental, is a more complicated arrangement than the above. Fig. 2 gives mitter as designed by the trans-Bell. NS Is the bar-magnet enclosed in a wooden case, C the coll of wire surrounding one of its poles. This coil of wire consists of a bobbin around which is wound a large number of coils of thin only so long as that change is taking insulated wire, the ends of the wire

operator speaks. P is caused to vibrate, induction currents are set P is caused to up in C, and are conveyed through the terminals TT to the line and hence The receiver is the to the receiver.



same in construction as the transmitter. Owing to the great resistance of the connecting lines, the operator receives the sounds with diminished strength, owing to the currents losing much of their energy in overcoming this resistance. Thus the above has a great disadvantage for long distances. To surmount this difficulty, the transmitter is now made as an adaptation of the microphone (see MICROPHONE). In this type of transmitter, the vibrating plate consists of a plate of carbon, its edges. Another fixed round plate of carbon is placed just behind, the intervening space being filled with very small pieces of carbon. One terminal is connected to a battery and the other to the line wire. The other terminal of the battery is connected to earth. A similar arrangement is made at the receiving station. The carbon particles form the bad contact of the microphone, and sound waves falling on the carbon plate cause these carbon particles to vary their resistance and thus cause fluc-

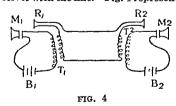
being connected to the terminals TT. mostly from a battery and may be The plate P is fixed in front of the augmented by a transformer. Fig. 3 pole fixed between the casing MM and shows a simple circuit of this type. the wooden case. The casing MM M represents the microphone, B the contains a central aperture exposing battery, R the receiver, and T the the plate P, into which aperture the transformer. The line wires, or the wires connecting the two stations, generally consist of copper wire.



towns they are placed underground, in a lead, insulated one from the other by a thick wrapping of paper. For very long distances the wires are placed overhead, fastened to pots of earthenware or porcelain for insulation purposes, and supported

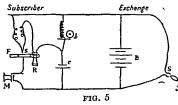
on poles.

Systems.—The simplest case is that of telephoning between two stations. The only requirements are a transmitter, receiver, a call bell, and the The return cirintervening wire. cuit may be made through the earth. The microphone transmitter and bell are generally worked by the same battery. A switch of some type is used for cutting the receiver or bell out of the circuit. Generally the switch works automatically. The receiver works automatically. is supported by a frame, which is pressed down by the weight of the receiver. The bell is now in the circult; this being the normal position of the receiver, the bell is always ready for action when the instrument is not in use. In taking up the receiver the frame rises, being actuated by a spring, and so cuts the bell out of the circuit and connects the receiver with the line. Fig. 4 represents



such a system, each station being supplied with both transmitter and re-Let the suffixes 1, 2 denote on. Both stations are conceiver. tuations in the current, which are the station. Both stations are condetected at the receiving station. structed in the same way, M. derhils, however, suffers from the disadvantage of long distances, but in R, the receiver, B, the battery, and T, this case the energy is derived the transformer, M2, R2, B2 T2 denoting the same parts in the second lators. When several stations are to be connected, each set is connected by a wire to every one of the others. In large towns, where there are numerous subscribers, each is connected to condenser.

minating in a small 'jack ' or spring. These jacks are all mounted on a switch-board, each jack having its number and capable of being connected to any other incl. nected to any other jack by means of This method is useful a flexible wire. for a small central station, but when the number of subscribers is large it would lead to confusion. In large stations the 'multiple board' system is utilised. The subscribers are classified into groups of two or three hundreds on one board, each board being by one operator. Each operator has in front of him the indicators for the subscribers on the board he controls, a jack also being provided for each subscriber. In



this way a subscriber may be connected to any other by passing along the boards. On the trunk wire system for connecting districts the trunk wire terminates at each exchange, and so may be connected to the jacks on the exchange. Fig. 5 illustrates the connection from the exchange to a Here it will be observed subscriber. that the whole apparatus is worked by the battery at the central ex-change, which consists of the battery B, the subscriber's jack J, which fits into the socket S. The subscriber's The subscriber's portion consists of the magnetic bell b, a condenser c, receiver R, the micro-phone M, and the frame F supporting the receiver. The diagram shows the apparatus when not in use. frame F makes or breaks the circuit through Rats. When R is taken off · in the k at s,

action. The condenser c is used for cutting off the continuous current from the central battery. All sub-scribers are joined up to the central exchange in this way, all the lines being joined across the same battery, which consists preferably of accumu- extremities of the jaws, and by the re-

The condenser c prevents any current from the battery flowing through the bell circuit, and thus a dynamo is employed at the central station to work the bell through the The terminals of the dynamo are connected to the operators' desks, so that any subscriber can be called up by pressing the corresponding button. If the subscriber wishes to call up the exchange, he simply removes the receiver off the frame and thus makes a complete circuit through s for the battery at the exchange. This works a relay at the exchange and so lights up an electric lamp, a lamp being placed in the circuit of every subscriber. The lighting of the lamp indicates that a call has been made from that subscriber. The 'jacks' used in each subscriber's circuit consist of three parts: a long spring, a short spring, and a ring which fits into the woodwork of the switch - board. The two springs make contact with the line wires, while the ring connects with a relay. Each of the three parts is insulated one from the other, and they are placed so that they make contact with corresponding parts of the switch springs. The operator has two of these jacks, one is the calling jack and the other the answering The jacks, when put into the switch springs, bring into action the battery and connect the necessary circuits. In each of the circuits relays and lamps are introduced, which can be worked by either subscriber concerned, indicating after the restoration of the receiver to the frame the end of the conversation. Various methods are employed in different systems; in some each subscriber has a small dynamo for actuating the call bells, and also a separate battery for working the micro-phone, but the one above described is the one in general use. National Telephone Company owned the telephone service of the United Now it is in Kingdom up to 1912. Now it is in the sole possession of the Post Office. an agreement between the National Service and the Post Office being made in 1905, by which the Post Office took over the complete service after the end of 1911. Local telephone services are worked by some municipalities. See Preece and Stubbs, Telephony, 1893; Herbert, Telephone System of Post Office, 1904; Webb. Telephone Service, 1904. Telerpeton, a foscil reptile found in

the Upper Trias of Elgin. The species is small in size and the genus agrees with the Homeosauride in its acrodont dentition, though differing by the presence of tusk-like teeth at the

for apparently magnifying a distant object and bringing it nearer to an observer. A telescope consists essentially of two parts: (1) The object glass or objective, and (2) the eye-lens. In refracting telescopes the objective consists of a lens or combination of lenses, which forms a real image of the object. In reflecting telescopes the incident rays are received by a concave mirror, which forms a real image of the object. The real image in both types of telescope viewed through the eye-piece, which simply forms a greatly magnified unreal image of the first image. Several persons are credited with having anticipated, if not actually made, a refracting telescope. It is certain, however, that in 1608 a Dutch spectacle-maker, Lippershey, constructed one. Galileo heard of the Dutchman's invention and immediately set to work to construct one. Instruments of the same kind were used by Marius and Harriot. The first night Galileo used his telewhich had a magnifying power of 30, he discovered the mountains on the moon and the four satellites of Jupiter. Galileo's instrument consisted simply of convex and concave lenses fitted at the opposite ends of a tube. The convex lens, the objective, forms a image of the object. forms a real inverted Between the image of the objective the concave image and the objective the concave lens is placed. This forms a largely magnified and reinverted image. The telescope of Galileo is extremely short and handy for manipulation. Thus his system has been used in the construction of opera-glasses. In the astronomical telescope, described first by Kepler, the objective, O in Fig. 1, consists of a large convex lens



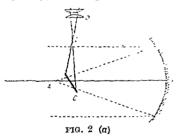
of long focus. This forms a real, diminished inverted image B of the object A. The eye-lens E is a convex lens of short focus. This simply lens of short focus. This simply magnifies and does not reinvert the image B. An instrument which gives an inverted image is obviously of

duction in the number of the phalan-geals of the fifth digit of the pes to two. B and E of Fig. 1. This forms a real Telescope. This instrument is used and reinverted image of B. This second image is then magnified by the lens E. It can easily be shown that in all refracting telescopes the magnifying power is the ratio of the focal lengths of the objective and eye-lens respectively. It is necessary then to have an eye-lens of small focal length and an objective of large focal The length of such a telescope must not be invariable. In the first place, the image given by the objective of a nearer object is farther from the objective than the image of a farther object. In the second place, the eye-lens must be nearer the image thrown by the objective for an observer who has normal sight than for one who is short-sighted. Therefore the telescope is fitted in a metal tube whose length can be altered at

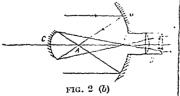
Defects of refracting telescopes.—In Galileo's telescope the image seen was very blurred and tinted with various This was due to the defects, colours. spherical and chromatic aberrations. A point source, on refraction through the lens of a telescope, does not give a point image, but a blurred blotch. This is due to spherical aberration (q.v.). The blurred blotch is also coloured because the lens of the telescope has different indices of refraction for various colours. This second defect is called chromatic aberration (q.v.).Huyghens, Cassini, Bradley, and others set about to avoid these defects by constructing huge tubeless aerial 'telescopes. Their results, however, though interesting, were only partially successful. In 1758 a scientist named Dolland succeeded in constructing an achromatic lens. There are two distinct defects in chromatic aberration: (1) The images formed by different colours are of different sizes, and (2) the focal length of the lens varies for the several colours. These two defects can only be corrected approximately at the same time. Dolland found that the dispersion for various kinds of glass differed, and that the dispersion of one kind of glass could be made to neutralise that of another. He constructed an objective consisting of a by a concave lens of fint glass, and thus obtained a compound lens whose focal length was constant for most, but not all, the colours. Not only that, but by altering the curvature of his lens somewhat, he corrected for spherical abstration also Since for spherical aberration also. Since Dolland's time the refractors have little use for viewing terrestrial ob-jects. This difficulty is overcome in colourless definite image can approxi-the terrestrial telescope. In this tele-mately be obtained. But even now

the achromatism is not perfect beconcave mirror C, which forms an cause of the irrationality of flint and image at I. This image is viewed cause of the irrationality of fine and indige at 1. This image is viewed crown glass. The deviation for through the aperture by means of an various colours is not proportional eye-piece. Cassegrain's telescope is a in the two glasses, so that only cermodified form of Gregory's, in which tain selected colours can be brought spierical aberration is overcome by to the same focus, the remainder using a convex mirror at C. In Herforming a halo round the image. schel's telescope (Fig. 2 (c)) the axis Although large refractors are more difficult to work with than small ones, they give a much more brightly illuminated image and have greater space-penetrating powers. The resolving power also increases with the size of the aperture. Dr. Blair has obtained a solution of mercury in hydrochloric acid which is more refractive and dispersive than crown glass. He used a lens of this solution in combination with one of flint glass and found that there was no tionality.' He made a telescope whose aperture was only one-third the focal length, and obtained an image with no residual colour.

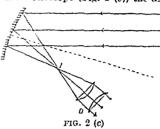
Reflecting telescopes .- There three types of reflecting telescope. Fig. 2 (a) gives a diagram of Newton's



reflecting telescope. The rays were received by a concave mirror of large received by a concave mirror of large focal length. The mirror would form a real image at A. The rays, how-ever, do not reach A, but are reflected from a plane mirror C so as to be re-ceived in an eye-piece D. In Gregory's



telescope, which was the first! telescope of this kind to be made, the concave mirror was pierced by a small central aperture (Fig. 2 (b)). The rays were reflected from the large mirror and received on a smaller



of the mirror is inclined to the incident rays. The image I is viewed directly by means of an eye-piece D. The advantages of using reflecting telescopes are: (1) Chromatic aberration is entirely absent, (2) they can be made of much wider aperture than refracting telescopes. The image, tuan refracting telescopes. The image, however, is not generally so bright as that obtained from the refracting telescope. Herschel devised his telescope to avoid loss of brightness by a second reflection, but even here the image is not so bright as that from a refracting telescope. The great defect is wetterlier telescopes is due to in reflecting telescopes is due to spherical aberration. A point source can only have a point image by re-flection if the reflecting surface is a prolate spherold formed by the rotation about its long axis of an ellipse, of which one focus is the object and the other the image. If the object is at a very great distance, a star for instance, the ellipse becomes a parabola. Thus, spherical abertation can be partially overcome by using parabolic mirrors. Even here, though we may have one point in focus, the other points of the object may not be so, but the error is small. In the --- the error modificathe convex mirror is hyperbolic. This givea much more definite image than a spherical mirror. The defect due to spherical aberration increases with But by u him a loop relimination of face the limiting of the mange is increased. Parabolic times, howwhich is deposited chemically, is extremely brilliant when fresh, and can be polished without fear of destroying the shape of the mirror. It can easily be dissolved off by means of acids and a fresh film deposited. This kind of reflector has now entirely superseded the former. Owing to its perfect achromatism the reflector has a great advantage over the refractor in spectroscopical work. Glass lenses also absorb light to some extent and show selective absorption for rays of short wave length. Ultra-violet spectra cannot then be photographed by a reflecting telescope. The absorp-tion of light also sets a limit to the size of refractors and thus on the width of aperture. Owing to its cheapness in construction, the reflector has an advantage over the refractor. The latter, however, is more suitable for purposes of exact astronomy because of its adaptability to forms of measuring apparatus.

Telescopium, a southern constellation.

a T., 3.8 Lacaille, and Ara.

Telford, Thomas (1757-1834), Scottish civil engineer, born at Esk-dale in Dumfriesshire. Among other works that he undertook may be mentio

(1793).bours c Canal.

be gathered from the fact that he was the engineer of more than 100 bridges in Scotland alone. He was one of the founders of the Institute of Civil Engineers (1818). See his Autobiography, 1838. He is buried in Westminster Abbey.

Tell, see Algeria and Tunis.
Tell, William, the hero of a Swiss legend, which first appears in a chronicle written between 1467 and 1476. The principal source, however, of the life and deeds of T. is the Helveticum of Ægidius Chronicon Tschudi (1505-72), from which Schiller took his drama Wilhelm Tell (1804). The story centres round the struggle for independence of the cantons Schwytz, Uri, and Unterwalden, and is as follows: T. having refused to do is as follows: T. having refused to do homage to the cap which Gessler, the Austrian governor, set up for that purpose in the market-place, was taken prisoner, and on being brought before the landgrave was promised his liberty if he could cleave an apple in twain, placed on his son's head, at the distance of eighty paces. He accomplished the task, but confessed

shape. About 1870, glass, covered in his hand was meant for Gesswith a thin film of silver, came into ler's heart had he failed, whereuse as a reflector. This film of silver, upon he was again seized and taken on the lake en route for Kusnacht Castle. But a storm having arisen, was asked to steer the ship, and while so doing effected his escape. He afterwards killed the landgrave, thus becoming the deliverer of his people. See Schiller's Withelm Tell, trans. by Albert Latham (Temple Classics).

American Latham (Temple Classics).
Tell-el-Amarna, a place in Middle Egypt, between Memphis and Thebes, on the r. b. of the Nile, with ruins of temple and palace of Amenophis IV. Notable for the discovery in 1887-88 of the 'letters'; about 300 clay tablets recording correspondence between Egypt and Assyria, Babylonia, etc. In 1891-92 Flinders Petric carried on further researches. See Winkler, Der Thomastellund von El-Winkler, Der Thontafelfund von El-Amarna, 1889-90; Keilinschriftliche Bibliolek, vol. v., 1896; Davies, Rock Tombs of Ell Amarna, 1899-90; Knudtzon, Die El-Amarna Tafeln, 1907-9.

Tell-el-Kebir, a vil. in the N.E. of Egypt, situated on the Freshwater Canal. It owes its fame to the fact that it was the scene of Lord Wolsey's (then Sir Garnet) great victory over Arabi Pasha, Sept. 13, 1882.

Tellers of the Exchequer, four collider where distinct the colling of the description.

officials whose duties were to receive money paid into the Exchequer, pay out money according to the warrant of the auditor of receipts, and keep accounts for the Lord Treasurer. The office was abolished in 1834.

TALLY. Telley, Gabriel, see Tirso de Molina. Tellicherri, a tn. and scaport of British India in Madras Presidency and Malabar dist. It is situated be-tween the French settlement of Mahé and Cannamore, 38 m. N.N.W. of Calicut, and is protected by a natural rock breakwater. The

exports are coffee, spices, sandal-wood, cocoanuts, etc. Pop. 28,000.
Telloh, or Tello, a site of ruins in Asiatic Turkey, Mesopotamia, recoulty excavated by De Sarzec. These explorations have supplied a series of ancient monuments of architecture and sculpture which can be dated. The chief portable remains are in the Louvre.

Tellurium (Te, 127.6), a rare element of the sulphur group. It occurs in the free state in nature, but is chiefly obtained in combination with other elements, as in tellurite (TeO₂) and tetradymite (Bi₂Te₂). It is a bluish-white solid with a metallic bluish-white solid with a metallic lustre (melting-point 452° C.; sp. gr. 6°26). T. forms tellurides with hydrogen and the metals, corresponding to the sulphides. Two oxides, the Two oxides, on compulsion that the other arrow dioxide and trioxide, are known,

which give rise respectively to the two acids, tellurous acid and telluric acid. Tellus, see GÆA.

Telshi, or Telszei, a dist. of Russia, in the gov. of Kovno and 178 m. N.W. of the city of that name, on Lake Matis. Pop. 11,200.

Pop. 11,200.

Telugu, a language spoken in S. India. It belongs to the Dravidian group of languages. The earliest known work in the T. language is a translation of the epic Mahabharata (q.v.).

Temanza, Tommaso (1705-89), an Italian architect, better known for his writings relative to art than by the buildings which he executed. In 1742 he became chief of the Commission of Engineers, and in this position was involved in several literary disputes. His chief work is the Vite de' miù Eccellenti Architetti e Scullori Veneziani, 1778

Temax, a tn. of Mexico in the state of Yucatan, 55 m. E.N.E. of Mérida.

Pop. 10,000.

Tembuland, a div. of the Cape of Good Hope, S. Africa, situated near the coast, to the S.W. of Griqualand East. It covers an area of 4117 sq. m. The name is derived from a Kaffir tribe, who claim to be descendants of Tembu. The coloured pop. in 1911 was 227,900 and the European \$200. Teme, a riv. of Wales, rising in

Montgomeryshire, near Newtown. It flows S.S.E. to within 3 m. of Worcester, where it joins the Severn. It

is noted for grayling. Length 60 m.
Temenos (Gk. τέμενος, τέμεν, to cut), the Greek term in archæology given to a piece of land marked off and consecrated to sacred uses: any sacred enclosure, as that surrounding or belonging to a temple.

or belonging to a temple.

Téméraire, a battleship of the British navy, begun in 1907 and completed in 1909. She has a displacement of 18,600 tons, a length of 520 ft., beam of 82 ft., and a maximum draught of 29 ft. She has sailed at a speed of 22.7 knots.

at a speed of 227 knots.

Temesvar, a royal free city in the co. of Temes, Hungary, stands on the Bega, 190 m. S.E. of Budapest. It is strongly fortified; is the see of a Roman Catholic bishop and of a Greek Orthodox bishop, with a fine cathedral and a castle. It has various property 202, 72, 555 manufs. Pop. 72,555.

Temir-Khan-Shura, a tn. of Russia in Transcaucasia, and cap. of the prov. of Daghestan, 418 m. N.E. of Tiflis. It is extremely subject to

fevers. Pop. 10,000.

Tempe, a famous valley of N. Thessaly in Greece. It is situated Thessaly in Greece. It is situated between the mountains Pelion and Ossa, and through it runs the R. Peneus. It has become proverbial for beautiful scenery.

Tempera, or Fresco Secco, FRESCO PAINTING and MURAL DE-CORATION.

Temperament, the modification of exact acoustic intervals so as to make relative notes correspond in successive octaves. Such a device became sive octaves. Such a device became necessary with the progress of harmonic writing, and in the early 16th century the Pythagorean third (ratio \$1:54) was superseded by the major third in ratio 5:4. Further changes were made in adopting mean-tone' T. (17th to 18th century) but although this gave six tury), but although this gave six major and three minor keys with fairly pure intervals, the other keys were so bad that modulation was impossible. The best system was the equal T. divider an octave into two country equal semitones. J. S. Back property on the T. and proved its modulatory value by writing his books of Preludes and Fugues for Well - tempered Clavier through all keys. In equal T, the octave is the only pure interval, the fourth and fifth being least incorrect of the others.

Temperance. The universal re-cognition of the social, moral, and physical evils which may be directly or indirectly traced to the excessive consumption of alcohol is perhaps the most promising and significant tendency in the collective effort of modern society. The whole mental attitude of civilised mankind has changed within the last century. Nor has the more critical attitude adopted been unaccompanied by the most widespread constructive deavour towards the abatement of intemperance. However, it seems tolerably safe to assume: (1) That the non-drinking or tectotaler numbers of the population have steadily increased; (2) that during the last eighty years the per capita consumption of absolute alcohol has slightly decreased: (3) that the heaviest drinking occurs chiefly among (a) degenerates and loafers, and (b) those whom poverty, unemployment, and illness have driven to this strange asylum of forgetfulness. There is a close relationship between intemperance on the one hand, and on the other pauperism, insanity, and crime. The Committee of the Lower House of Convocation of the Province of Canterbury (convened in 1869) reported that at least 75 per cent. of the occupants of workhouses and a large proportion of those in receipt of out-relief had become 'pensioners on the public, directly or indirectly, through drunkenness and consequent im-providence. The percentage of male cases of insanity due to intemperance has for the last forty years, according

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to the Lunacy Commissioners, been! on an average about 18.6; of female cases, 7.1. Dr. Edgar Sheppard, one time superintendent of Colney Hatch Asylum and professor of psychological medicine, put the figure at from 35 It seems safe to to 40 per cent. assume that nearly one-fourth of the total insanity of the country is due to drink. The following table of particulars from the Report of the Commissioners of Prisons in 1898, cited in Rowntree and Sherwell's The Temperance Problem and Social Reform (1899), goes most clearly to illustrate the relationship of drink to crime. The table relates 1166 commitments to Warwick prison from April 1897 to March 1898:

Charged with being drunk Crimes directly due to drink . Crimes arising from avoidable and unavoidable povertyprobably 50 per cent. of the poverty arising from drink Crimes due to the moral state of character, 30 per cent., perhaps, the result of drink, i.e. of the said moral condition . Arising from passion, with more

or less provocation Bad company (the drink ele-ment comes in here again) . Negligence, imprudence, etc.

> 1166 Total .

So far as political measures for reform are concerned it is to be noted that in England (and in a lesser degree in U.S.A.) there is considerable justification for the widespread accusations levelled at the liquor trade and its vast wealth and resources. Brewers' Almanack gives a list of over 120 brewery and distillery companies in the United Kingdom which have a share and debenture capital of over £70,000,000. Vested interests on this scale are eloquent to explain why the 'trade'e

a nower.

munity.

adopted

T. movement in 1826 may be conveniently classified into: (1) Prohibition and local option, (2) the Scandinavian company system, (3) state monopoly or municipal control, (4) the institution of counter attractions, (5) high licence, (6) taxation of liquor. Prohibition has been adopted in certain of the United States, and, as exemplified in that country, means the suppression of the buying and selling of liquor within the limits of the particular states which have adopted the prohibition laws, the effect being that there is nothing to prevent a consumer from transporting

purposes purchased in a non-prohibition state. Thus stated, prohibition is clearly outside the scope of this article altogether, since it aims, or seems to aim, not at T. but at teetotalism. In so far, however, as the principle is attempted to be made operative through a system of local option, it is relevant, though it seems better in this connection to distinguish between the two policies by calling one national prohibition and the other local option. It has met with but indifferent success, many It has met states having tried and abandoned the experiment. The chief causes of its comparative failure seem to be the profitableness of the liquor traffic, the political influence of the liquor trade in the prohibition states, and police corruption or 'graft.' There is, it must be conceded, little to be said a system which purports abolish a commodity which is a necessary of life to the vast majority and which, by the curious argument of its protagonists, is only effective where there are 'neighbouring facilities for the purchase of liquor by those who are accustomed to use it.' English T. organisations have with but few ex-199 68 ceptions never favoured the principle. but are for the most part strongly in favour of that of local option (sec LOCAL OPTION). Under the Scan-86 61 dinavian company system-called the Gothenburg system, from the fact that that town was the first large town to adopt it—the liquor traffic is controlled by companies to whom the municipal authorities transfer liquor licences, such companies undertaking to carry on the trade solely for the good of the working classes and not to derive the slightest private profit from the traffic other than the ordinary rate of interest on the capital invested. If a manager fails to carry out the bylaws of a Bolag or Samlag (the Swedish and Norwegian name for such companies respectively) his dismissal can be promptly effected without the necessity of a costly trial. The concurrent features of this system are the establishment of eating-houses and reading-rooms in the Bolag or Samlag premises, the refusal to serve young persons with liquor, the reduction in the hours of sale, and the voluntary abandonment by the companies of a number of the licences handed over to them. The licences handed over to them. system of state monopoly has been adopted in Russia and S. Carolina. It is accompanied by the abolition of onconsumption of spirits in the state drinking premises, and many other stringent provisions against public inducements to tippling, and it has also been effective in reducing inteminto a prohibition state liquor for his perance in a country which was over-

run with the evil. The high licence of touch gives no accurate knowledge scheme of vaska, as to whether one body is hotter than Pennsylva Union Slocumb Law of Nebraska in 1881. Its object is to reduce the number of drinking saloons, firstly by vesting the power to grant licences in the hands of a quarter sessional court or other public authority, and secondly by fixing the fees for licences at an

are always rea ready purchasers 01 in many places the icapable or un-

growth of unlicensed drinking establishments. (As to the system of high licence duties, see under Licensing and Licensing LAWS.) On the whole the most promising 'solution' of the drink problem lies in the direction of the municipal control of the drink traffic. Mr. Sherwell and Mr. Rowntree, supported by an imposing body of sympathisers, thus state their conclusions

for the system
(1) That localiti traffic either dire.

panies under the direct supervision of the central government and within statutory limits; (2) that the whole of the profits shall in the first instance be handed over to a central state authority; (3) that the only benefit which a locality shall receive from the profits shall be in the shape of an annual grant, in ratio to population and not profits earned, from the state authority for the establishment of recreative centres; (4) that the right of prohibition shall be given to every local authority, which, if exercised, shall not debar such authority from the annual grant above alluded to; and (5) that the co-operation of influential citizens, outside the local governing body, shall be invited in the

50. C Gothenburg and Bergen Public monde Systems; Malins, The Gothenburg System, 1897; Gould, Popular Control of the Liquor Traffic, 1894; Joseph Chamberlain, The Right Method with the Publicans, 1876; E. J. Wheeler, Prohibition: The Principle, the Policy, and the Right 1804; Machania Solver So.

and the Party, 1894; Mackenzie, Sober by Act of Parliament, 1896. See also INEBRIATES; LICENSING AND LICENS-

ING LAWS.

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Temperature, in physics, is the condition of a body on which its power of transferring or receiving heat from

of the another. In order to do so one of the the other effects which heat produces 1881. on matter is employed. The effect generally made use of is, that most substances, when heated, change in size, and in gases the change is pro-portional to the T. over a very large range. Of liquids, mercury is generally adopted. Its expansion is not strictly proportional to the T.; thus most thermometers contain this liquid, the T. being indicated by the measurement of the volume of mercury contained. Alcohol is used for the measurement of low Ts. owing to its low freezing-point, but is of little use for high Ts. owing to its low boiling-point. The most accurate thermometer is the gas thermometer. change of state of substances is also used for indicating T., the unit of T. being obtained from the range of T. between the melting-point of ice and the boiling-point of water at 760 mm. the range being divided pressure, into 100 equal parts on the Centigrade thermometer and 180 on the Fahrenheit. The variation of the re-

> also utilised for the measure-ment of T. These electrical thermometers are made to yield very accurate results. For absolute T., see Thermodynamics; Gases and Vapours;

which occurs with a change

PYROMETER; and THERMOMETER. Tempering, a process by which steel is brought to any required degree of hardness, toughness, and elasticity. The process consists essentially of heating the steel to a high temperature and suddenly cooling it by immersion in water.

Tempesta, Antonio (1555-1630), an Italian etcher and painter, executed frescoes for t

of Gregory of the Innoc

church of

Tempesta, Cavaliere (1632-1701), a Dutch painter, born in Haarlem, and was called Pieter Molyn. His cognomen 'Il Tempesta' has reference to the excellence of his seascapes and storms, whilst a second, 'de Mulieribus,' recalls his shameless profligacy, which led to his wife's murder and a sixteen years' term of imprisonment.

Tempio, or Tempio Pausenia, a tn. of Sardinia in the prov. of Sassari, and 30 m. E.N.E. of the town of Sassari, Pop. 14,000. Templars, or Knights Templars, the

most famous and most powerful of the great military orders of the middle ages. They are known also as the Brethren of the Temple at Jerusalem, another body depends. The sensation the Soldiery of the Temple, or the

ing zeal which marked the 11th and 12th centuries. Besides the T., we have also the Knights of the Hospital of St. John of Jerusalem (commonly called the Knights Hospitallers) and the Teutonic Knights of St. Mary of Under the provincial masters were Jerusalem, or German Knights of the the priors, otherwise called bailiffs or Cross. Of these three orders, that of the Temple was the first, and that of the Teutonic Knights was the last. Order of the Templars was founded in 1118 or 1119 by nine French knights, then fighting in the Holy Land. Their original vow was simply to maintain free passage for the pil-grims who should visit the Holy Land. The name that they first took was the Poor Soldiers (Pauperes Commilitoires) of the Holy City, and they professed to have no source of subsistence but the alms of the faithful. The king of Jerusalem, Baldwin II., gave them their first place of residence, a part of his palace; to which the abbot and canous of the church and convent of the Temple, which stood adjoining, added another building for keeping their arms. From this last they obtained the name of T. The militant rule of the T. attracted general attention, and so favourably was it regarded that in 1120 the Hospitallers obtained from Pope Calixtus II. a new rule on a similar plan. The T. were first regularly formed into an order under the next pope, Honorius II., who confirmed their regulations and assigned a white mantle as their badge, to distinguish them from the Hospitaliers, who wore a black mantle with a white cross. In imitation of this white cross, Pope Eugenius added a red cross on the left breast to the mantle of the T. The Ts', standard, Beauscant (O.Fr., a black and white horse), was a red cross on a field striped black and white, and Beauseant was the famous war-cry of the order. The order spread rapidly throughout Europe: legacies and donations in lands and money were showered upon it by persons of all ranks; members of the noblest families in every nation of Christendom cagerly sought to be The rapid increase in ioined to it. power and wealth was injurious. the three vows of poverty, chastity and obedience, the first two were utterly disregarded. The order, indeed, became a by-word for the indeed, became a by-word for the very contraries. The constitution of the Knights Templars was simple. At the head was the grand master, who was not only elected by the chapter or general body of the knights, but was also very much controlled by it. Under the grand master. trolled by it. Under the grand master

Soldiers of Christ. The great religious other high officers were the marshal, orders are three in number, and all the treasurer, etc. The several counowe their origin to the burst of crusad- tries in Asia and Europe in which the order had possessions were denominated provinces, and each of them was presided over by a resident chief, called indifferently a grand prior, grand preceptor, or provincial master. masters, who each had charge of one of the districts into which the province was divided; and finally, under the priors were the preceptors, each of whom presided over a single house or establishment, hence called a preceptory. The head province was that of Jerusalem, and here the grand master resided till 1187. After this Acre, and then to he retired to Limisso. The history of the Knights Templars would embrace the history of the wars of the Christians against the Infidels in the East for all the time they lasted after the establishment of the order. For more than 170 years the Soldiers of the Temple formed the most renowned portion of the Christian troops, and almost every encounter with the enemy bore witness to their powers and daring. The destroyer of the T. was Philip le Bel of France, who had long been their foe. He compelled his creature. their foe. He compelled his creature, the pope, to summon the grand master, Jacques de Molny, to Europe. In 1307, whilst Molay was at Paris, two individuals of notoriously evil character lying in prison made certain revelations accusing the T. of heresy, idolatry, unbelief, and a number of foul practices. On Sept. 12, sealed letters were sent throughout France, to be opened the next day and then to be opened the next day, and then all the T. in France were seized simultaneously. By torture and other means more revelations were secured. and Philip managed to persuade the other European princes to join with him against the Templars. By 1320 the order was at an end, except in Portugal where it merely took the new name of the Order of Christ. Template, or Templet, a pattern by

which to shape something, especially in profile; it is usually flat and made of thin wood or metal. The name is also applied in building to a short strong stone or timber used to dis-

tribute thrust or weight.

Temple, The. The Heb. word hêkâl is translated in the O.T. sometimes as temple,' and sometimes as ' palace. The idea of the royal residence is, of course, common in these cases. Sometimes, as in Ezek. xli. 1, and 1 Kings vi. 17, it denotes only the fore part of the building, the Holy Place as distinguished from the Holy of Holies. Three great temples were erected to be a constant of the series of the Holy of the series of the course of the was his seneschal or lieutenant, and Jehovah during the history of the

children of Israel. (1) Solomon's Temple. This was erected by Solomon in conjunction with his own palace to the N. of Jerusalem on Mt. Sion. Ac-cording to 1 Chron. xxviii. 11-19, the exact plan of the building was drawn by David, guided by the hand of the Lord. In front was a porch, 20 cubits in length and 10 in breadth. The entrance was supported by two brass pillars, and was probably lower than the main body of the Temple. 2 Chron. iii. 4 gives its height as 120 cubits, which should, perhaps, be reduced to 20. This led into the fore part of the building, 20 cubits by 40, and this again to the hindmost chamber, 20 cubits by 20. With the exception of the porch, the house was surrounded by an annex of side chambers in three stories, each 5 cubits in height. number of these side rooms, in which were placed the stores and treasures of the sanctuary, is unknown. The Temple building was surrounded by the inner court (1 Kings vi. 36, vii. 12), as distinguished from the outer or great court which longed to the royal residence. be-Temple of Solomon was burnt by the command of Nebuchadnezzar on the 9th or 10th day of the fifth month of his nineteenth year, 588 B.C. (2) The Temple of Zerubbabel. The building of the post-exilic Temple was comor the post-exinc remple was commenced in 536 B.C., but was soon interrupted (Ezra iii, 8). The sanctuary was, in fact, restored under Darius, from 520-516 B.C. An edict of Cyrus (Ezek, vi. 3 ff.) gives the height of the Temple as 60 cubits, the breadth being the same. From the years 168-165 B.C. the Temple was turned into a heathen sanctuary, but at the close of this short period was restored to its original use. (3) The Temple of Herod was a magnificent restoration of the former Temple, and this last period is by far the most brilliant in the Temple history. The forty-six years over which the work was extended and the magnificent proportions of the finished work are referred to in the

Temple, a city of Texas, U.S.A., in Bell co., situated in a cotton-growing district, 35 m. S.S.W. of Waco. It was founded in 1881, and chartered as a city in 1884. Pop. (1910) 10,993. Temple, see INNS OF COURT.

Temple, Dorothy (1627-95), the daughter of Sir Peter Osborne, married in 1655 Sir William T., the statesman. Her delightful letters to her hundred statesman for traditions. her husband were first published in Courtenay's Biography of Temple (1836), and were praised by Macaulay. A more complete set was issued in 1888.

lege, Oxford, where he met and formed a friendship with Dr. Jowett. Matthew Arnold, and Clough. Temple was ordained deacon in 1846, and priest in 1847. Scholastic labour now seemed to be his mission, although he undertook some Government work in London before becoming headmaster of Rugby. His friendship with Gladstone, whose Liberal views he shared, led to his being appointed to the see of Exeter, where he won for himself great popularity by his sincerity and manfulness. He was directed to the bishopric of London in 1885, and in 1896 he was nominated Archbishop of Canterbury. Among the ideals which Dr. Temple had much at heart was the cause of temperance, on which he spoke and wrote largely. He was very interested in the subject of education. He died at Lambeth Palace, Dec. 22. Sco Life by E. G. Sandford.

Temple, Henry John, sec PALMERS-

TON. Temple, Sir Richard (1826-1902), born at Kempsey, Worcester, and received his education at Rugby and Haileybury. He entered the Bengal civil service in 1846, and rose rapidly in it. He became lieut. governor of Bengal (1874-77), and then governor of Bombay (1877-80). On his return to England he sat as Conservative member for the Evesham division from 1885-92, and for the Kingston division from 1892-95. He published an autobiography in 1896.

Temple, Richard Grenville, Earl

Temple, Richard Grenville, Earl (1711-79), the brother of the premier, who succeeded Bute in 1761. the brother-in-law of the elder Pitt, and held office under him during the years 1758-61. He was a bitter and consistent opponent of Bute, but supported his brother's Stamp Act against the probably wiser views of

Chatham.

Temple, Sir William, Bart. (1628-99), statesman and man of letters, travelled in his youth, and in 1655 married Dorothy Osborne. He settled at Sheen in 1663, and was employed on various missions. Three years later he was created baronet, and appointed envoy at Brussels. He was responsible for carrying largely through the triple alliance formed against Spain in 1668 between England, Holland, and Sweden. He was later ambassador at the Hague, but was recalled in 1670. Four years after he returned to the Hague to arrange a marriage between Princess Mary of England and William of Orange. He was offered a secretaryship of state in 1677 and again in 1679, but declined office on both occasions. When he removed to Moor Park he engaged Temple, Frederick, Archbishop he removed to Moor Park he engaged (1821-1902), educated at Balliol Col-Swiftas hissecretary, and was assisted

by him in the composition of his Bedfordshire, England, on the Ouse Memoirs. There is a biography by and Ivel, 9 m. N.E. of Bedford. Pop. Courtenay (1836), reviewed by Macaulay in the Edinburgh Review. (1911) 500.

Temryuk, a seaport tn. of Russia, in

Temple Bar was a famous gateway of London dividing Fleet Street from the Strand. When the sovereign visited the city, the custom was to ask the permission of the Lord Mayor to pass T. B. The old archway was built by Wren in 1670, but was removed in 1878 and was re-erected at Waltham Cross, Herts. It is now represented by a monument called The Temple Bar Memorial.

Templemore, a par. and market tn. of Ireland, in co. Tipperary, on the Suir, 8 m. N. of Thuries. It is supposed to owe its origin to the Templars. Pop. (1911) 2900.

Templenewsam, a tn. of W. Riding of Yorkshire, England, situated in the parishes of Leeds and Whitkirk, 3½ m. E. of Leeds. It was named from a settlement of the Templars in 1181. In 1545 Lord Darnley, husband of Mary Queen of Scots, was born here. It is the Temple Stowe of Scott's Ivanhoe. Pop. (1911) 2400.

Temple Society, a body of German Protestants, whom many of settled in Palestine in agricultural colonies at Haifa, Jaffa, Sarona, etc. They expect the immediate return of Christ to judge the earth. The body was formed in Würtemberg in

1854.

Templin, a tn. of Germany in the prov. of Brandenburg, and cap. of the circle Templin, on Lake Templin, 43 m. N. of Berlin. Its ancient wall has the cate of the manufactures. has three gates. The manufactures are agricultural machines, etc. Pop. 5670.

Temporal Power, see PAPACY.

Temps, Le, one of the leading French dailies, founded in 1861 by Nefftzer, a publicist of pronounced neo-Hegelian views, mainly with the object of furthering the interests of international trade. It was the pioneer in French journalism of the system of employing a good staff of foreign correspondents. Though literature and critiques have a place, Though the paper is essentially a political organ and has always been characterised by its Liberal opinions, albeit expressed in a restrained yet sound Nefftzer and philosophical manner. abandoned the direction of the T. in 1872, though he continued to collaborate with his successor. Among its most notable contributors have been (religious discussion and criticisms); Sainte - Beuve literary (literary causerie); and Brisson and Blanc (publicist articles). It favours a republican form of government, and invariably condemns jingoism.

Tempsford, a par. and vil. of E.

Northern Caucasia, in the gov. of Kuban. It is situated on the Sea of Azov, and was once a Turkish fortress. There are flour mills, mineral mines, and an export trade in grain. Pop. 15,000.

Temuco, a tn. of Chile, and cap. of the prov. Cautin, 7 m. N.N.E. of Valdivia. Pop. 16,000.

Temuka, a tn. of South Island, New Zealand, in Geraldine co., N.N.E. of Timaru. Pop. 2000.

Ten, Council of, a secret committee of the Venetian Senate, established in 1310 and vested with such a measure of executive authority as was deemed effective to cope with extraordinary crises. Its institution marked the final overthrow of the pre-existing constitution, democratic acting through a Great Council of all the citizens under a supreme magistrate. the Doge, in favour of a system of close oligarchies of hereditary aristo-After the defeat of Tiepolo's revolution (1310) against the growing exclusion of so many Venetians from any share in the government, the aristocratic element deemed it advisable that the Great Council, then composed almost entirely of the nobility (q.v.), should elect ten of its members, the Doge, his council, and the Supreme Court another ten, and that from these the Great Council should make a final selection of ten to act as a committee of public safety. When the Great Council finally became a mere electoral body and the legislative and judicial powers of the Senate were overshadowed by the C. of T., that body, though theoretically outside the constitution, became inferior in authority only to the collegio or ministers, the six ducal councillors immediately in touch with the Doge, and the Doge himself. Its numbers varied from time to time from ten to seventeen, and it was not finally abolished until 1797, the date of the fall of the republic. see ELASTICITY. and

Tenacity,

STRENGTH OF MATERIALS.

Tenaille Trace, a system of fortification whereby the flanks of the fortification are practically back to back between the faces.

Tenancingo, a tn. in the state of Mexico, 45 m. S.W. of Mexico City. Pop. 10,000.

Tenant, see Landlord and Tenant. Tenants in Common, see Common,

TENANCY IN. Tenasserim: 1. A tn. of Lower Burma on the T. riv. 2. A div. of Lower Burma, consisting of a narrow strip of land lying to the E. of the Bay

of. Bengal. Cap. Maulmain. 36,080 sq. m. Pop. 1,160,000.

Ten Brink, see BRINK.

Tenbury, a tn. of Worcestershire, England, on the Teme, 22 m. N.W. of Worcester. It has mineral springs. Pop. 2000.

Tenby, a municipal bor, and sea-port of Pembrokeshire, Wales, 9 m. E. of Pembroke. It is an interesting old town and a much frequented watering-place. Pop. (1911) 4362.

Tench (Tinca vulgaris), a common freshwater fish characterised by exceedingly small scales, abundant secretion of mucus, and the presence of a short barbule at each angle of the It is rich olive green in mouth. colour, shading into light grey on the belly. It spawns in early summer, the greenish ova numbering about 250,000. Like the carp, to whose family it belongs, it feeds on both animal and vegetable substances, and if fattened in a clean stew-pond makes

good eating.
Tencin, Madame de, Claudine Alexandrine Guérin de (1681-1749), the daughter of Antoine Guérin, Seigneur of Tencin. Claudine was educated at the convent of the Dominicans of Montfleury, near Grenoble, and took the veil there in 1696 against her own inclinations at the instance of her parents. She soon found means to escape. In 1714 her act was regularised by a bull of secularisation from Rome. In Paris she opened a salon, and began a life of gallantry and intrigue. Fontenelle and Matthew Priore, among others, were in constant attendance on her. When she was attendance on her. When she was about forty-five years of ago, Madame de T. took to literature. Among her works were Les Malheurs de l'Amour and Des Mémoires du Comte de Comminges.

Tenda, Col di, a pass of the Maritime Alps, and on the road from Nice to Cuneo, which is pierced by a tunnel of over 2 m. in this place.

Tender, in law, means an offer of money in payment of a debt. To be valid it must be (1) unconditional. Hence if the debtor tenders money only on condition of getting a stamped receipt, or if he tenders too large an amount and demands change, the T. is bad. But a T. will not be invalid merely because it is made under protest. (2) Of the whole debt; though if the creditor's claim is made up of separate items the debtor may validly make a T. of payment of any one item provided he makes it clear in respect of which item it is made. (current coin of the realm. (3) In the Tener Gold is highest good to any amount; silver not beyond it is also ... Toyde, 40s.; copper not beyond one shill and has an elevation of 12,180 ft. ling. A bearer banknote is good T. There are really two peaks to this for all sums over £5, but a T. in countain mass, which is a dormant

Area | try notes or by cheque is good if the creditor refuses to accept merely on the ground the amoun cheque are

does not extinguish the debt, but it exposes the creditor in his action against the debtor as the litigious oppressor, and a plea of T., if sustained by t

the : the

pleads T., must pay the amount into court. The other effects of T. are that it stops the further accrual of interest, and extinguishes any right of lien (q.v.) the creditor may have.

Tendon, a band or cord of white tissue which connects a muscle with The fibres of which Ts. are the bone. composed are arranged parallel to each other in the direction of the stress, and form a dense compact structure of great strength and flexi-bility. The T. is attached at one end to the muscle and at the other to the periosteum of the bone, with which it is so intimately commingled that the rupture of a T. at its junction with the bone is often accompanied by the detachment of a fragment of bone. In their course Ts. often pass round bony projections in the manner of a pulley, and in some cases sesa-moid bones are developed.

Tendon of Achilles attaches the muscles of the calf of the leg to the heel-bone. It is capable of resisting a great tensional strain, and yet is sometimes ruptured by the contraction of the muscles in sudden extension of the foot. Ancient surgeons regarded wounds in this tendon as fatal. It was so called from the hero Achilles, whose mother dipped him when an infant into the Styx, so that he became invulnerable except in the heel by which she held him.

Tendril, a modified branch which weak-stemmed plants, such as peas, vetches, and vines, are able to rise above ground by clinging to stronger plants or other objects for support. Ts. are extremely sensi-tive, and are brought into contact with some means of support by making revolving nutations.

Tenedos, an island in the Ægean Sea, 5 m. from the coast of Asia Minor, near the entrance of the Dar-

Minor, none and danelles. Its chief export is danelles. Its chief

volcano, the other being Pico Chathe Hague; he became pastor at Midhorra, with an elevation of 9880 ft. delburg. His works are; De Schephorra, with an elevation of 9880 ft. There has not been an eruption since 1798, but volcanic disturbance has taken place in the neighbourhood as late as 1909. The peak has snow on its slopes all the year round. It is 11 m. from Orotava at the base to the summit.

Tenesmus (τείνειν, to strain), the straining of the bowels in an unsuccessful effort at evacuation. It is distressing symptom of certain intestinal diseases, especially

dysentery.

Tengri Khan, see KHAN-TENGRI.

Teng-Yuah-ting, see MOMEIN. Teniers, David, the Elder (1582-1649), a Fler in pointer hom at Antwerp. He

Rubens and L.... at Rome. He chose for his subjects familiar scenes of ordinary Flemish life. His 'Rocky Landscape,' 'The Conversation, and Playing Bowls are in the National Gallery,

London.

Tenison,

Toniers, David, the Younger (1610-94), a Flemish painter, the son of David T., the Elder, from whom he received his principal instruction. He was a master in the Antwerp Guild (1632-33). He was appointed court painter to Archduke Leopold and keeper of his pictures. T. painted pictures for him, many of which are now in the Imperial Gallery, Vienna, and at Munich; and he also copied other masters for him. and some of these copies are in the Wallace Collection, London. Many of his works are also in the National Gallery, among which are: 'The Money Changers,' The Village Fête,' 'Spring,' Summer,' Autumn,' and 'Winter.'

Archbishop of Canterbury, born at Cottenham in educated at th Norwich, and a. . He was made Cambridge. minister of St. Andrews, Cambridge, and rector of Holywell in Hunting-donshire; and in 1680 was presented to the living of St. Martin's-in-the-Fields. Fields, London. In 1689 he was made archdeacon of London in 1691 bishop of Lincoln, and in 1694 arch-bishop of Canterbury. In his parish of St. Martin's in-the-Fields he endowed a free school and founded a library.

Thomas

(1636 - 1715),

Ten Jurisdictions, The League of, the name applied to the league formed on the death of Frederick,

ping (The Creation), De Planetin (The Planets), and De Juargetijden (The He translated from many languages.

Tennant, Sir Charles (1823-1906), well-known ironmaster. He became interested in politics and in 1878 was returned to l'arliament as member for Glasgow, which he represented for two years. From 1880 to 1886 he was member for Peebles and Selkirk, being created a baronet in 1885. He was the grandson of the Scottish industrial chemist, Charles Tennant (1768-1838), who invented a bleaching liquor and a bleaching powder.

Tennant, Sir James Emerson (1804-69), an author and politician, born at Belfast. He became a member of Parliament for that town in 1832, and occupied later many important government posts. He was secretary to the Board of Trade (1852-67). Amongst other publications he wrote

Ceylon, 1859.

Tennant, William (1784-1848), a Scottish scholar and poet, born at Anstruther in Fife. Handicapped from birth by being a cripple, he became clerk to a brother who was a corn factor, but the business failed and Tennant became a schoolmaster at Dunino (1812), Lasswade (1816), and Dollar (1819) successively. He studied Oriental languages and gained an extraordinary knowledge of Hebrew, Arabic, and Persian, which eventually led to his obtaining the professorship for Oriental languages at St. Andrews University. He was also a great Italian scholar, and he introduced a certain style of verse used by Italian poets in his Anster Fair (1812). His other works include: The Thane of Fife, 1822; Papistry Stormed, 1827, written in Scottish dialect; two plays, Cardinal Beaton, 1823, and John Baliol, 1825; besides a number of Hebrew dramas taken from Bible history.

Tennemann, Wilhelm Gottlieb (1761-1819), a learned philosopher of the school of Kant in Germany, born at Brembach near Erfurt. At the University of Jena in 1781 he gave himself wholly up to philosophy. At the outset of his career he was a decided opponent of the philosophy which heafterwards appropriate in the participation. which he afterwards embraced. 1792-95 he published in four volumes his System der Platonischen Philosophie. T.'s Geschichte der Philosophie. of which eleven volumes were com-Count of Toggenburg (1436). It was pleted at the time of his death (1798-the last of the three great leagues formed by the Swiss.

Ten Kate, Jan Jacob Lodewijk Hume's Treatise of Human Nature (1819-89), a Dutch author, born at and Locke's Essay into German.

of N. America, having an area of 42,050 sq. m. Its boundaries on the N. are Kentucky and Virginia; on the E., N. Caroline; on the S., Georgia, Alabama, and Mississippi; and the Mississippi on the W. separating it from Arkansas and Missouri. Along eastern boundaries rise the Unaka and Great Smoky Mts., with peaks over 6000 ft. high, whilst between these highlands and the Cumberiand Plateau, the mean elevation of which is 2000 ft., is the valley of E. Tennessee, which is part of the Great Valley of the Alleghanies. The Cumberland R., an affilient of the Tennessee, waters a fertile valley W. of the Cumberland Mts. Level tracts in the W. are drained by the lower Tennessee. The state enjoys a very pleasant climate, the average annual fall of snow being 8 in. and of rain 52 in. The mean extremes of temperature are 38° F. in the winter and 78° in the summer. Over a half is still woodland, and lumbering and timbering bring in a larger revenue (30,457,000 dollars in 1909) than any other industry. Cultivated lands are dispersed over the rest, the best crop being maize (88,298,000 bushels in 1912), though conditions are quite favourable to the growth of wheat, oats, potatoes, and peanuts. Cotton, tobacco, and fruits, especially straw-berries, are also oultivated. The fields of bituminous coal cover an area of 4400 sq. m., and pig-iron, copper, and phosphate rock bring in rapidly increasing incomes. The annual products from flour and grist mills are worth 29,070,000 dollars (1909), and besides foundries and blast furnaces various textile factories are now Nashville is springing up. Nashville is the capital, but the largest city is Memphis, whilst Chattanooga and Knoxville are also important. Pop. (1910) 2,184,789.

Tennessee River is the largest (950 m. long) tributary of the Ohio, U.S.A. The Holston and Clinch, which unite near Knoxville, Virginia, are the headstreams. The T. winds with a devious course through E. Tennessee, Alabama, W. Tennessee, and Kenbucky, and finally reaches the Ohio at Paducah. It is navigable from the mouth to the Mussel Shoal Rapids, and again from Knoxville to a gorge some 500 m. up, known as the Suck. There is communication by railroad between the randa

Tenniel, Sir John (b. 1820), an English cartoonist and caricaturist, born in London. He is especially famous in connection with Punch, with in connection with *Punch*, with the sides, 3 ft. in the centre. The roof which he was associated for many of the penthouse is 7 ft. wide, and is years. He studied for a short time at 7 ft. 1½ in. high at the side of the

Tennessee, a central southern state | the Royal Academy. and his first picture appeared at the exhibition of the Society of British Artists in 1836. His design for a mural decoration of the new palace of Westminster in 1845 resulted in his being commis-sioned to paint a fresco in the House of Lords. Meantime his reputation as a humorous artist had grown, and in 1850 Mark Lemon invited him to succeed Richard Doyle as joint cartoonist with John Leech in Punch, his illustrations to Æsop's Fables having attracted much attention. His first drawing appeared in the initial letter on p. 224, vol. xix., and his first cartoon was 'Lord Jack the Giant Killer,' representing Lord John Russell attacking Cardinal Wiseman. Some 2300 cartoons and smaller drawings were executed by T. before he severed his connection with Punch in Jan. 1901. In them can be traced a political history of the period. His wonderful drawing and the originality of his conceptions coupled with his extraordinary sense of humour make him unrivalled as a cartoonist. His illustrations to Lewis Carroll's Alice in Wonderland and Through the Looking-Glass have delighted children of all ages. He was

knighted in 1893. Tennis, one of the oldest ball-games Tennis, one of the oldest ball-games in existence, is often called royal T. or court T. to distinguish it from lawn T. It was played by the kings and aristocracy of France and England before the 14th century, and at one time became so popular in England that laws were passed prohibiting it. These were revoked by Henry VII., who played at Windsor Castle, while his son built a court at Hammton Court Palace. At the Hampton Court Palace. At the present day it has lost much of its former popularity owing to the expense of erecting and keeping up a court. Edward VII., when Prince of Wales, used to play at Prince's. Other courts are at Queen's, Lord's, Manual Courts and Courts are at Queen's, Lord's, Manual Courts and Courts are at Courts and Courts and Courts are at Courts are Other courts are at Queen's, Lord's, Marylebone, Brighton, Oxford, and Cambridge. In 1899 the Queen's Club Championship was thrown open to all amateurs. The most recent champions are H. E. Crawley (1892-94), Sir Edward Grey (1895-96, 1898). E. H. Miles (1899-1903, 1905-6, 1909-10), Jay Gould (1907-8), and Hon. N. B. Lytton (1911-12). The courts vary slightly in dimensions, the actual floor measuring 96 ft. by 31 ft. 8 in. Bound the two ends and 31 ft. 8 in. Round the two ends and one of the side walls run the dedans and corridor, a covered passage with a sloping wooden roof called the pent-house. Across the middle of the court is stretched a net 5 ft. high at

court and 10 ft. 7 in. at the further! edge. The balls weigh 21 oz. and are 21 in. in diameter. The length of the racket is 2ft. 2 in. and its weight about 16 oz. The game may be played by two or four players, and the method of scoring is the same as that used in lawn T. The winner of the toss takes the service and plays from any part of his court, striking the ball so that it goes over the net and bounces from the side penthouse into the service-court. The striker-out should then return the ball over the net at volley or after one bounce without striking the play-line or touching the roof. If a player fails to return a ball a 'chase' is made; the marker calls out 'chase four,' better than three,' 'second gallery,' according to the root or which the bell will be the spot on which the ball falls, the court spot on which the ball fails, the court being marked off in chases, and strokes into galleries and doors also counting as chases. If the second player afterwards makes a better chase than the first he wins the chase, but if he makes the same chase it is 'chase off,' and the score is unaffected. The winning of a chase unaffected. The winning of a chase counts one point. When two chases have been made, or one, if either player is within one stroke of a game, the players change sides. A set, is the best of classes. set is the best of eleven games. Strokes are also scored by hitting the ball into the winning hazard, viz. the last gallery on the hazard side into the grille or dedans. Consult Heathcote, Tennis, Lawn Tennis, Rackets, Fives, 1903; Marshall and Tait, Tennis, Rackets, and Fives, 1890; and Eustace Miles, Racquets, Tennis, and Squash, 1902.

Tennis, Lawn, see Lawn Tennis. Two Brothers, to which Frederick had every way successful, and the poet contributed four pieces. Early in the used in later life to say: 'The peace following year he and Charles went of God came into my life when I to Trinity College, Cambridge, and married her.' In April Wordsworth

Shalott, The Lotus Ealers, and A Dream of Fair Women. These, though unfavourably reviewed by the Quarterly, found some appreciation at the hands of the public, and T.'s work began to be known to and admired by a small circle. It was not until 1842 that T. brought out another collection of poems, which contained the cream of his earlier work, and in addition many new pieces. T.'s finan-cial position was at this time un-sound, and to make his mind easier. his friends contrived to induce Sir Robert Peel in 1845 to grant him a civil list pension of £200 a year. The Princess (1847) was T.'s first popular success, and this ran through five editions in six years. The favour with which this poem was received was,



ALFRED TENNYSON

Tennis, Lawn, see Lawn Tennis.

Tennyson, Alfred, first Baron (180992), a poet, the fourth son of the Rev.
Dr. George Clayton T., rector of
Somersby, and a younger brother of
Charles T. (afterwards Turner) (q.v.)
and Frederick T. (q.v.). He was born
at Somersby on Aug. 6, and in 1827
the and his brother Charles published
a little volume, entitled Poems by
Two Bralbers, to which Frederick had
Two Bralbers, to which Frederick had
Tevery way successful, and the neet there joined the famous set that indied, and the office of poet-laureate was offered to Samuel Rogers, who, mble, Arthur though he would have welcomed the mble, Arthur though the would have welcomed the r. Thackeray. The Gre earlier, thought that at eighty-seven he was too old to hold it. The cellor's Medal for English verse in honour was then offered to, and 1829, when the unpromising theme accepted by T.—a very sound choice. Shortly after T. acquired a house, brought out a volume of Poems chiefly Lurical that contained some charming the tile of Wight, which was his verses, which were favourably reviewed by Leigh Hunt and others. In 1833 appeared the slim volume of poems which included The Lady of nothing for three years, when came

the popular and Fousing verses, The Charge of the Light Brigade. This was followed by Maud, and other Poems (1855), the exquisite Hall (1869), the Charge (1859), The Holy Grail (1869), Locksley Hall (1869), and Demeter, and other Poems (1889), which compass being from tenor C to volume contained the beautiful the first soprano. It is so called because in the first soprano. It is so called because in the first soprano. play, Queen Mary, was published in 1875, and Harold two years later. Becket was printed in 1884, and nine years later was produced on the stage at the Lyceum Theatre by Sir Henry Irving, in whose repertoire henceforth it was a valuable item.
T., whose health had never been robust, and who had lately suffered from illness after illness, died on Oct. 6. T.'s place in English literative. ture is assured, although, perhaps, the time has not yet arrived when it is possible definitely to say exactly where it is. With the possible excep-tion of Browning, it will be generally admitted that he is the poet of the Victorian era in merit. In popularity, of course, he easily distances his great rival. He had a great lyrical an army in the field, are held in dis-gift, and his best work was done in arour nowadays by military authori-that strain. The wider public, howof the beauty of lyrics, and by it T.) vog to fine beauty of lyrics, and by it T.) vog to fine beauty of lyrics, and by it T.) vog to fine beauty of lyrics, and by it T.) vog to fine the King, and for such pieces as che must be the King, and for such pieces as che will survive. There are biographies by his son Hallam (1871), K. F. Horton, and Morton Luce (Temple Primers); and constant of the cavalry to every fitteen non-ministence of officers and men, and the cavalry to every twelve. ever, has not a very keen perception out in the open has also increased the been published.

Charles. afterwards Tennyson, Charles Tennyson-Turner (1808-79), a poet, the elder brother of Alfred, Lord T., with whom he was at Trinity College, Cambridge. In 1827 he and Alfred published Poems by Two Brothers. He wrote many exquisite sonnets, and issued collections of these in 1830, 1864, 1868, and 1873. These were collected in 1880 by his nephew Hallam. He was from 1837 vicar of Grasby, Lincolnshire.

Tennyson, Frederick (1807-98), a Tentacles, a delicate organ of touch, poet, a brother of Alfred, Lord T., prehension, or defence, possessed by contributed four poems to the Poems large numbers of invertebrates, in-by Two Brothers (1827). Am works are The Isles of Greece Daphne (1891), and Poems of

and Year (1895).

Tennyson, Hallam, second Baron (b. 1852), in his youth served as private sceretary to his father, whose biography he wrote in 1897, and whose works he edited in 1908. He whose works he edited in 1908. He also collected and edited the Sonnets of his uncle, Charles Tennyson- S.S.E. of Maidstone. Its clurch,

the popular and rousing verses, The Turner. He was governor and com-

treble A, i.e., an octave below soprano. It is so called because in the old plainsong the tenor-part was of sustained notes around which the harmonics were set. 2. The viola, 3. The leading bell in a peal.

Tenos, or Tinos, one of the Cyclades Archipelago, in the Algean Sca. Its area is 79 sq. m. The chief articles of trade are wine and marble.

12,000.
Tenrec, or Tailless Hedgehog, see CENTETES.

Tent, a shelter made usually of canvas, but of a flexible material, which is supported on a pole and stretched by means of cords fastened to peas in the ground. They form the chief covering for troops undergoing practical training, but owing to their weight and the fact that they hamper

Special accommodation is made for

the officers. The Ts. are 10 ft. high and have a diameter of 121 ft.

Tent, the name given in England to a variety of Spanish wine. It is produced chiefly in the Rota district in the S. of Spain, and has a full, sweet flavour and a deep red colour, whence the name from Spanish tinto. Owing to the low proportion of alcohol in its composition, it is often used for sacramental purposes in churches.

regarded by some authors as a pteropod. It has a thick solid shell in the form of an clongated cone, and ranges through the Ordovician to the Devoniau.

which

Augustinian monastery, is crowned with a lofty tower. Pop. (1911) 3376. Tenterden. C. arles Abbott, first Baron (1762-1832), born at Canter bury. His father was a barber, and sent him to King's School at Canterbury. He studied the law and was bury. He studied the law and was admitted to the bar, and became a special pleader. He was made recorder of Oxford in 1801, and the following year published his treatise Law relative to Merchant Ships and Seamen. In 1816, he was puisne judge in Court of Common Pleas, and two years later was appointed Chief Justice. He was created Baron T. of Henden in 1827. He is buried in the Henden in 1827. He is buried in the Foundling Hospital, London. His treatise mentioned above is still an authority in mercantile law.

Tenterfield, a municipality of Clive co., New South Wales, 330 m. N.N.E. of Sydney. It is an important region, producing gold and tin. Pop. 2800.

Tenthredo, see SAW FLIES. Tenths: 1. The tenth part of the annual profit of an ecclesiastical living which formerly went to the pope, but at the Reformation was transferred to the Crown. Afterwards various benefices were exempted from payment of T. altogether (see QUEEN ANNE'S BOUNTY and TITHES). 2. In music, the octave of the third; an interval comprehending nine conjoint degrees, or ten sounds, diatonically divided.

Tentori, Cristoforo (1745-1810), an Italian historian, spent most of his years in Venice, and wrote not only a complete history of the Venetian republic (in 12 vols. 1785), but also a clear account (published in 1799) of the machinations to which the French had stooped in 1797 in order to compass the ruin of that republic. Tenure is defined by the classic

Williams as the relation between feudal lord and tenant of land (Real Property). This is sufficiently accurate because the feudal system is the foundation of modern English real property law, although the fabric of that system was effectually shattered in the early part of the 17th century. Many of the incidents of the feudal system existed in England prior to the Conquest, but the theory that all land was held mediately or immedi-ately of the sovereign in return for either free or base services was essentially a Norman innovation adapted by the Conqueror from the continental feudalism. The only competing system of T. was the 'mark system' (which existed before the Saxon invasion), under which pasture and waste lands were held in common

once formed part of an annually allotted for cultivation. This system, says Stubbs, soon gave way to one of absolute ownership (allod), and in any event it would have collapsed at the Conquest, though there were for long consequences of its existence in the shape of (1) communal pasture land (Fielden men-tions Port Meadow at Oxford) and (2) townships. Apparently a few old boroughs are a pure development of the mark system, and though most townships became Norman manors, it would in many modern cases be difficult to establish any royal over-lordship. In return for his loan of land the feudal tenant was bound to perform either free or base services. From these services were developed respectively freehold T., and copyhold through T. in villeinage. Of freehold Ts. the most honourable was that of knight service (early commuted for sculage or shield-money), the various incidents of which (fealty, aíds, reliefs, wardship, marriage, primer seisin) were, however, attached to socage T., the T. which historically is commonly opposed to it. Most of the ancient feudal incidents were abolished by the Statute of Tenures which assimilated knight service to free and common socage. The only incidents surviving are escheat, a small quit-rent, and a relief in the form of one year's rent on succession to a deceased tenant. There were also various exceptional forms of the above two cardinal divisions of T., some of which probably existed long before the Conquest. They were: (1) grand serjeanty (q.v.); (2) cornage (Lat. cornu, a horn), i.e. T. on condition of winding a horn to give warning of a hostile incursion by the Scots (these two were species of knight service, and the Dukes of Norfolk, Marlborough, and Wellington still hold lands by T. of grand ser-jeanty); (3) petit serjeanty (T. directly of the Crown by the service of giving some martial necessary in time of war); (4) burgage T. (q.v., and Borough English), consisting now of ancient borough freeholds; (5) gavelkind (q.v.). These are all species of free socage T. In addition to all these, there was the electrosynary or spiritual T. of frank-almoigne (free alms) by which which (free alms), by which religious houses held on various indeterminate conditions of spiritual services, e.g., praying for the soul of the donor. Villein or base T. did not primarily constitute T. at all, as the 'tenant' had no common law estate and was a mere furming licensee. Later, when his uncertain and servile labours became commuted for a money rent, ownership by tribal heads of families his T. developed into copyhold land and the arable land of the tribe (i.e., land held by copy of manorial

court roll). court roll). All copyholds must be of parts of the body, and with moupart of some manor, and hence none strosities. See Deformities, Dwarr, can have come into existence after the Statute of Quia Emptores (q.v.). GIANT, STENOSIS, ALBINISM, MELANMANORIAL LAND ABOUT A CLUB-Manorial lands in England comprise besides copyhold land (1) manorial freehold estates in fee simple, usually held subject to quit rents, heriots (q.v.), or on other more or less archaic conditions; (2) customary 'freeconditions; (2) customary 'free-holds' or copyhold tenure by the oustom of ancient demesne, reputed to be ancient patrimonial possessions of the Crown (going back to the time of Edward the Confessor according to Domesday Book), which were kept in the king's own hands to provide a revenue for maintaining the royal dignity. See also DE DONIS, ENTAIL, ESCHEAT. ESTATE, FORFEITURE, LAND, LAND LAWS, and LANDLORD AND TENANT.

Teos, now Burdrum (q,v_*) .

Tephrosia, a genus of leguminous plants and shrubs with silky pinnate leaves and axillary racemes of white,

red, or purple flowers.
Tepic: 1. A ter. of Mexico. duces sugar, cotton, tobacco, maize, etc., in the lower regions. Area, 11,275 sq. m. Pop. 171,337. 2. The cap. of above ter., a prosperous tn. with a healthy climate. Manufs. cotton-stuffs, cloth, and cigars. Pop.

16,805.
Teplitz, Teplitz-Shönau, or Toplitz, a tn. and watering-place of Bohemia, Austria, 80 m. N.W. of Prague.
Manufs. machinery, metal goods, chemicals, hardware, cotton, lace, the machine of the ma furniture, etc. There are lignite beds in the near neighbourhood, and it has famous saline-alkaline springs. Pop.

26,776. Terai, see TARAL

Teramo (ancient Interamnium), a tn. in Italy, cap. of prov. of same name. It is the seat of a bishopric, and has a fine cathedral and several churches. Chief manufs., wool, silk, straw hats, and pottery. The town consists chiefly of narrow lanes, but has one broad street with large houses. Pop. 25,000.

Terang, a tn. of Victoria, Australia, 25 m. N.W. of Warranambool. Dairyfarming is the chief industry.

1800. Teraphim, a word occurring fifteen times in the O.T. The T. were images of household gods, occupying the place of the Lares and the Penatiamong the Romans. Six times in the With the thus translationary description. A.V. it is thus transliterated (especially in Jud. xvii. and xviii.), seven times it is translated 'images' (Gen. xxi. 19, 34, 35, etc.), once it appears as 'idols' (Zech. x. 2), and once as 'idolatry' (1 Sam. xv. 23).

Teratology, the science dealing with

All copyholds must be of parts of the body, and with mon-FOOT, HARELIP, INVERSION, HERMA-

PHRODITES, PATHOLOGY, etc.
Terburg, or Ter Borch, Gerard (1617-81), a Dutch painter, whose subjects are generally portraits, conversations, persons engaged at different games, performers on musical in-struments, ladies at their tollet; born in Zwolle. He studied in Haarlem, Italy, and France, and visited England, Germany, and Spain. One of his masterpieces, 'Peace Congress of Münster,' is in the National Gallery. London. Not only was his technique very fine, but he could depict emotion, as is evidenced by his 'Paternal Warning' hung in the Amsterdam Museum.

Terce, in Scots law, a real right whereby a widow, who has not ac-cepted any special provision, is en-titled to a life-rent (q.v.) of one-third of the heritage in which her husband died inteft (see INFEFTMENT), provided the marriage has endured a year and a day and has produced a living child. See English CURTESY.

Terceira, see Azores.

Terebinth, or Turpentine Tree (Pistacia terebinthus), the small tree from which Cyprus turpentine is obtained

by making incisions in the trunk.

Terebratula, a genus of brachiopods with a smooth oval convex shell.

The beak is truncated and perforated, and the animal is attached by a pedicle. The species were very numerous in the Tertiary epoch, and, as in the case of other brachiopods. only a few survivors remain.

Teredo, or Ship Worm, a genus of lamellibranch molluses with a long worm-like body clothed in a thin shelly tube or sheath. The true bi-valve shell is small and occurs at the thicker end where it protects the various organs. At the more slender end are two tubes, one of which conveys water to the gills and the other expels it with excavated matter. With its sucker-like foot it bores into timber, and is very destructive to

ships and piers.

Terek: 1. A Russian prov. in N.
Caucasus, which includes the greater
part of the basin of the Terek. It
borders on the Caspin cattle country is remarkably fertile, and huge quantities of corn are grown, over 75 per cent, of the population adopting this industry. The orchards and vineyards of the district are numerous and very fertile. There are several health resorts in the region, which are very popular amongst the abnormal developments of formations | Russian natives. Galeun ore is worked

here. Cap. Vladikavkas. Area 27,902 sq. m. Pop. 1,182,700. 2. A river of N. Caucasus. It rises to the S. of Mt. Kazkek, and flows through a mountainous district until it reaches the town of Vladikavkas. It develops at its mouth into a delta. Length 350 m.

Terence (Publius Terentius Afer) (c. 190-159 B.C.), a Roman comic poet, born at Carthage. He was the slave of a Roman senator, but received a good education from his master on account of his personal attractions as well as his literary tastes, and was soon emancipated. His first play was the Andria, said to have been much praised by Caccitius, the foremost comic poet of the time, and by the publication of this he found himself introduced into the most refined and intellected since of Parce 14 he intellectual circles of Rome. He became acquainted with Scipio, Lælius, and Furius Philus, and through Scipio probably had an introduction to Polybius. He spent some time in Polybius, Rome, but eventually went to Greece, where he occupied himself with translating the works of Menander, whom he took as his model. Of his works only six are extant: Andria, first represented in 166; Hecgra, 165; Heauton Timoroumenus, 163; Eunuchus, 162; Phormio, 162; and Adelphi, which was first_acted at the funeral games of L. Æmilius Paulus, 160.

Terentius, Clemens, a Roman jurist, probably of the same legal school as

Julianus, who flourished under the Emperor Hadrian. He wrote Ad Leges, Libri XX., a treatise on the Lex Julia et Papia Poppea.

Teresa, or Theresa, St. (1515-82), a Spanish nun, born at Avila. She entered a Carmelite convent in her native town in 1533, but seeing the relayation of discipling within the relayation of discipling within the rerelaxation of discipline within the religious orders determined on reform, and set about founding a house in which all the original rules of the Carmelite order would be observed. She met with great opposition, especi-ally from the authorities, but having obtained permission from the pope, she established (1562) the ancient Carmelite rule at a small house in Avila which she dedicated to St. Joseph. Here the sisters (at first only four in number) lived subject to the strictest discipline: they were sandals of rope, slept on straw, ate no meat, and were confined to the cloister to live on alms without regular endowment. After a time the number was increased to thirteen, and T. herself took up her abode with them, spend-ing, as she says, the five happiest years of her life. She was conspicuous for her saintliness, and was subject to visions, an account of which is con-tained in her autobiography. Her

tion, The Castle of the Soul, and The Book of the Foundations, all of which have been translated by Woodhead's translation of The Way of Perfection, reprinted by Waller (1902), is in the Cloister Library. See Life by Mrs. Cunningham-Graham,

Termites

Terespol, a tu. and fortress of Russian Poland, in the Siedlee gov., on the l. b. of the R. Bug, opposite Brest-

Litovsk. Pop. 5000. Tergeste, see TRIESTE.

Ter Goes, see Goes.

Tergoviste, or Targuvistea, a tn. in the prov. of Prahova, Roumania. Has historic ruins and an important arsenal. Pop. 10,000. Pop. 10,000.

Terlizzi, a tn. of Apulia, Italy, 17 m. W. of Bari. Trades in wine and fruit. Pop. 23,394.

Terminable Annuities, see under PUBLIC DEBT.

Terminalia, a genus of trees and shrubs (order Combretaceæ) with racemes or spikes of white, yellow, or green flowers. Numerous species occur in tropical Asia and America.

Termini Imerese (ancient Thermo: Himeracæ), a tn. and seaport, prov.

Himeracæ), a tn. and seaport, prov. of Palermo, Sieily, founded by the Carthaginians in 407 n.c. It has a fine harbour, and trades in oil, cereals, and fish. There are hot mineral springs in the vicinity. Pop. 21,000. Terminus, in Roman mythology, was the god of boundaries and frontiers. His worship is said to have been introduced by Numa, who instructed every one to mark the boundaries of his land with stones consecrated to Jupiter, and to offer yearly sacrifices at these stones. This yearly sacrifices at these stones. This festival was called Terminalia, and was celebrated on Feb. 23.

Terminus, or Term, in sculpture and architecture, a pillar statue, that is. either a half statue or bust, not placed upon, but incorporated with, and as it were immediately springing out of, the square pillar which serves as its

pedestal.

Termites (Termitidæ), a family of insects (order Platyptera), characterised by the possession of biting jaws and by the absence of a meta-morphosis. Ts. are the only insects other than those belonging to the Hymenoptera which are known to exist in organised communities. their habits they resemble ants in many respects, and are often called 'white ants,' though structurally they differ from them very considerably, while their communities are differently composed. The communities consist of 'kings' and 'queens' which are fertile males and females that have cast their wings by a rupture at a transverse suture close works include: The Way of Perfecto the root; and of infertile males and

females whose wings never develop, the wing, skimming the surface of the and who become 'soldiers' or sea from sunrise to sunset in search workers according to the nature of their food. The head is large, and though many forms are blind, others have compound and simple eyes. The 'soldiers' are provided with especially large heads and powerful mandibles. The queen's abdomen becomes enormously swollen, her ovaries producing eggs at the rate of about one per second. She and the king are usually confined in the central cell in the nest, and in case of disaster to them, nymphs are always in readiness to take their place, after stimulation of their reproductive organs by special feeding. Ts. are confined to the tropical and warmer temperate regions, some species occurring in S. Europe. They feed on wood and waste substances, and construct earthen tunnels and galleries. Some of the tropical species raise vast earthen nests as much as 20 ft. high.

Terms: 1. In law the limitation of an estate or the whole time or duration of an estate, as a lease for the T. of twenty-one years, for the T. of three lives, etc. (see also LIMITATION).

2. The law T. or portions of the year during which the High Court sits. They are four in number, viz., Hilary, which usually begins about Jan. 11 and ends about the end of March; Easter, which begins in the early part of April and ends in the middle of May; Trinity, which begins towards the end of May and ends towards the end of July; and Michaelmas, which begins in the second week in October and ends just before Christmas. The 'Inns of Court' T., called by the same names as the above, are the dining terms' for students, who in the process of qualifying for call to the bar fulfil the notion of residence that obtains in colleges or other places con-ferring degrees by eating dinners during T. time. 3. In universities and colleges the time during which instruccongesthe time during which instruc-tion is regularly given to students, who are obliged by the statutes and laws of the institution to attend lectures. 4. In formal logic, the ex-pression in language of the notion obtained in an act of apprehension. T. are divided into simple, singular, universal, common, univocal, equivo-

universu, common, univocat, equivo-cal, abstract, concrete, etc. (see also SYLLOGISM). 5. In algebra, a member of a compound quantity; as, a, in a+b; or ab, in ab+cd.

Tern, or Sea Swallow (Sterna), a genus of birds resembling the gulls, to which they are allied, but smaller and slenderly built and with a forked tall. They are avtensively distri-

of small fish and other marine animals. A number of species occur in Britain, the commonest of which is S. fluvialitis, with grey plumage. The others are the sooty T. (S. fuliginosa), the Arctic T. (S. macrura), the Sandwich T. (S. casiria). The black T. and other similar species known as marsh Ts. are now placed in the genus Hydrochelidon. They are distinguished by their shorter bills, short and slightly forked tails, and less fully webbed feet.

Ternate, a tn. on an island of the same name in the Malay Archipelago. Has a good harbour and is the headquarters of the Dutch residency of T. Covers an area of 25 sq. m., and has a government quay and private pier. Has no considerable trade or shipping, its harbour possessing no bar. Pop.

3000.

Terneuzen, see NEUZEN.

Terni, a tn. in the prov. of Perucia, Terni, a tn. in the prov. of Perucia, Italy, among the Apennines. Has important steel works and iron foundries. There are numerous interesting antiquities, and it is the birthplace of the Emperor Claudius. Near by is the famous Velino waterfall, affording water power for the iron wards and factories of the town. Pon. works and factories of the town. Pon.

31,000.
Ternstræmia, a genus of evergreen shrubs and trees (order Ternstræmiacæe), some species of which are miacæe), some species of which are miacæely grown in the stove-house.

Terpander, the father of Greek music, and through it of lyric poetry. and flourished between 700 and 650 B.C. See Smyth's Greek Melic Poels, 1900. He was a native of Antissa in Lesbos

Terpenes, the name given to hydro-carbons which occur in essential oils and have a molecular formula C10 H10. They are all volatile, and are unsaturated compounds. The most im-

dance'), the muse of entire conjugated ance. See MUSES.
Terra, or Tellus, the name under which the earth was worshipped in Rome. See GEA.

Terrace Gardens are a series of flat walks or gardens, usually constructed where the ground slopes sharply from a house on one or more sides of it. The soil is retained by means of stone or brick walls, which themselves offer considerable scope for decorative tail. They are extensively distributed, especially in temperate clibroad and laid out in beds as flower
mates. Though poor walkers and
swimmers, they are very active on another by stone steps.

occurring as marked interruptions of to theaction of hot springs; the water, sloping ground. River T. occur wherever the valley has been sufficiently widened and graded to allow formation of flood-plain. On reducing the level of its flood-plain, the portions resting on the valley sloves are left as ledges which remain until an earthquake. weathered away; two or three of these are often traceable, and are useful in constructing the history of the river. Smaller T. are formed in higher courses of rivers by the washing up of material forming the banks; they are not level, but have a slight gradient towards the river. Lake T. are similarly formed. The age of such formations is prehistoric, and they are in consequence particularly valuable geologically, affording evidence of aquarian life and plant life on the ancient banks. Remains of animals are numerous, as the T. were frequented in various parts as watering-places, and many animals fell as prey. Evidences of human life and activity are also found, parti-cularly stone implements. Shore T. are due to the washing up of sand. shingle, and gravel with organic remains by the storms and high tides; they are uniformly narrower. River, lake, and shore T. are all found in raised positions due to movements of raised positions due to movements of the earth's cruest, and form a valuable means of measuring these in amount and time. Raised T., or beaches, as they are called, are common in Norway and Scotland, where they form striking features of the landscape; when formed by the sea they are horizontal or slightly sloping away from the water. A terres formation from the water. A terrace formation occurs geologically when denuded land is formed of horizontal strata; the residual hills and mountains are flat-topped with terraced sides. This is a marked feature of the formation of the whole continent of Africa: the most remarkable instance, however, is found in the Colorado region of Western U.S.A., where the dry climate preserves the natural features. Such T. are also the result of past volcanic action, the levels being formed of successive flows of lava; the islands N. and W. of Scotland, and Antrim in W. Ireland, are good examples. Cultivation T. are commonly found in dry mountainous regions, such as Spain and Tibet; they were a marked feature in the old civilisation of Peru, and are still preserved and worked. vantage is taken of any inequality in the mountain side, and successive generations of cultivators gradually extend the levelling; such a T. retains water fairly well, and the soil being virgin and continually renewed is generally of great fertility. The Pink

Terraces are level stretches of land | and While T. of New Zealand were due being highly charged with dissolved calcareous and siliceous matter, on reaching the air and cooling denosited the sinter in level terrace formation. These beautifully coloured formations were destroyed in 1886 by

> Terracina, a maritime tn. of Italy on S. coast of prov. of Rome and 60 m. S.E. of that city. Trades in wool and cereals. It possesses the celebrated temple of Venus, thought to be the palace of Theodoric. Pop.

11,000.
Terra Cotta, baked clay used for bricks, tiles, and architectural ornaments, as well as for tombs and coffins, statues and statuettes. It may be left with its natural brown surface unglazed and uncoloured, or it may be painted as was customary among the Greeks, or it may be covered with a solid enamel of grave or brilliant colours. The Louvre. British Museum, and the museums of British Museum, and the museums of Berlin and Athens have remarkably fine collections of the Greek and Roman T. Cs., and many provincial museums, such as those of Florence, Perugia, Rome, Naples, Nimes. and Arles, have also collections of importance. The best collections of Greek T. C. figures are in the British Museum, the Louvre, and the museum of Berlin and Athens. In Museum, the Louvre, and museums of Berlin and Athens. the Victoria and Albert Museum there is a remarkable collection of fine Florentine T. Cs. of the best periods. In parts of Italy the architecture of the later Gothic style and of the early Renaissance is marked by a free use of T. C. In the 19th century its use was largely revived, and it has been employed in England for architectural work (e.g. Natural History Museum at S. Kensington, as well as in other large towns), being especially suitable as a building material because of its capability of resisting the acids and soot contained in the atmosphere. See Murray's Handbook of Gree'-Anderson and S ture of Greece and . Ancient Pottery, Art of the Gr Museum Catalog

1903. Terra del Fuego, see TIERRA DEL FUEGO.

Terra di Lavoro, see CASERTA. Terra-firma, a term used to denote main or continental land as opposed to insular. The name was particularly used in the middle ages for that part of the Italian mainland which was subject to Venice.

Terra Japonica, see CATECHU. Terranova, a seaport on the S. coast of Sicily. It was founded at the | Irish T., the Welsh T., the Sealyham end of the 13th century on the site of the ancient Gela. Manuis. coarse cotton and woollen goods, and has fisheries of tunny and sardines. ports wine, grain, sulphur, and soda. Pop. 22,000.

Terrapin, a name given to various tortoises of the family Emydide, some of which are highly valued as food. Among the most important are the yellow-bellied, the red-bellied, the chicken, and the salt-water Ts. They are all active swimmers, their clawed digits being united by a web. They are almost omnivorous, feed but chiefly on aquatic animals. America and Australia they are commonly kept and fattened in captivity.

Terra Rossa, a ferruginous red earth which occurs in the limestone district of Dalmatia, and is the result

of sub-aerial disintegration,

Terre Haute, a city of Indiana, U.S.A., co. seat of Vigo co., on Wabash R., 68 m. W.S.W. of Indian-Has foundries and manufs. apolis. goods, cars, clothing, glass, There is a state normal school iron and polytechnic engineering institute. The town is situated on high ground, and has wide, well-paved streets. Pop. (1910) 58,157.

Terrell, a city of Texas, U.S.A., Kaufman co., 30 m. E. of Dallas. Cotton is the chief manuf. Pop.

(1910) 7050.

Terre-Noire, a tn. in dept. of Loire, France, 1 m, N.E. of St. Etienne. Has steel works of considerable importance. Pop. 5200.

Terrestrial Magnetism, see MAGNET-

ISM, TERRESTRIAL.

Couperie, American in Terrien de la Couperie, Albert (1845-94), a philologist, born in Ingoville (Le Havre), but ultimately came to London and became naturalised Englishman. He made a special study of ancient inscriptions He made a and Chinese characters, and made a catalogue of the Chinese coins in the British Museum. He wrote: The Oldest Book of the Chinese; Early History of Chinese Civilisation; On the History of the Archaic Chinese Writings and Text; and The Languages of China before the Chinese. He was for a time professor of comparative philology at University College

London. Terrier, a term originally applied to dogs which pursue rabbits and other game into their burrows, but now applied to a number of breeds most of which are too large and some too pampered to justify their name. The best known are the Smooth and T., the Bull T., the White English T., the Black and Tan T., the Yorkshire

T., Skye T., and the Clydesdale T. Terriss, William, originally William Charles James Lewin (1847-97). an actor, after serving for a short time in the merchant service, went on the provincial stage in 1867, and soon came to London, where his breezy style secured him a leading position. His best parts were Squire Thornhill in Olivia and William in Black-eyed Susan. He was assassinated at the stage door of the Adelphi Theatre, where he played leading parts, by an unsuccessful actor. There is a bio-

graphy by Arthur Smythe, 1898. Territorial Force. In 1907, Territorial Force. In 1907, by means of the Territorial and Reserve Force Act, Lord Haldane attempted to establish a voluntary army for the defence of Great Britain and Ireland, which being in itself a complete army would suffice for the defence of the home country and would permit of the employment of all our regular Langella The scheme was

etically volunand the being cheme. ritorial

scheme was very much higher than that of the old volunteer system. The territorials formed in themselves a complete self-contained army. terms of service were enlistment for four years with the option of re-engagement at the close of that period, a certain definite number of national to those

numcases ek to : men

need not attend the same drills at the same time, and that, therefore, completecompany drill offer impercible. Annual camp in min ; which is com-pulsory, save in a far a civil (1.5 %) ments prevent, amount to between eight to fifteen days, and this annual training always takes place at the same time, usually during the early part of August. During 1909-10 to bring great nt numthe T. he force bers. gained a considerable number of re-

cruits, but the numbers again fell away and another great effort was This attempt made in April 1912. was, on the whole, not quite so successful, but did much to show the Wire-baired Fox T., the Scotch or necessity for constant recruiting.

Aberdeen T., the White West Highland T., the Dandy Dinmont, the
Bedlington, the Airedale T., the artillery, garrison artillery, engineer, tain other departmental troops. The establishment of men and officers is 315,984, and the actual numbers on April 1, 1912, were 9382 officers and 269,173 men. There is still at the present time (1913) a shortage of over 50,000 officers and men. The force is enlisted for service at home only, but volunteers may be called for in case of active service for service abroad, and the question of willingness to serve abroad is usually put to the territorial when he enlists. County associations have been formed in order to administer the Act and to supervise the finance and buildings of the territorials. Associated closely with the territorials are the officers' training corps and cadet corps. Some schemes have been put forward since the first organisation of the territorials in order to make the scheme more feasible as far as drills and camps are concerned. The mostwide-reaching probably was the grant of a separation allowance to married territorials who remained in camp for fifteen days. The question of the supply of horses was one of the greatest problems of the county associations, and this has been solved partially by a system of 'horse letting' which the War Office and the county associations have now taken up. AT. F. Reserve has been formed, but has appealed so far more to the officers than to the men. Territorial Waters. Most modern

states recognise the sovereignty of every other state over its own marginal waters. The limit is generally fixed at one marine league from the shore measured from low-water mark. This distance of permissible appropria-tion is the subject of much criticism by writers on international law. because it was in its origin suggested by the supposed range of a gun; the tremendous range of modern artillery has made the distance meaningless (see on this Hall, International Law). The acquittal for want of jurisdiction of a German prisoner charged at the Central Criminal Court with manslaughter through the running down of the Strathelyde by the Franconia (in the famous trial of Reg. r. Keyn. 1876) two miles off Dover led to the passing of the Territorial Waters Jurisdiction Act, 1878. By that Act the English courts have jurisdiction to arrest and try persons, whether British subjects or not, for offences committed on the high seas within the T. W. of the Crown, i.e., within one marine league from the coast.

Terror, Reign of, sec FRANCE-History.

Terry Family, English actors and amily, English actors and Neilson, as an actor-manager, and Benjamin Terry (1818-92) has played with her in Sweet Nell of actresses.

infantry, and cyclist corps, and cer- and his wife were well-known provincial actors, although in their later years they also had engagements in London with Macready and Charles Kean. Their daughter Kate Terry (b. 1844), the eldest of the family. made her first appearance on the stage in 1850, and the next year came to London and was engaged by Charles Kean. She played Robin in The Merry Wives of Wināsor and Prince Arthur in King John, in which part she was much praised by Macaulay. She subsequently appeared as Cor-delia, Ophelia, Ariel, Juliet, Viola, all of which she played with remarkable success, but especially made a great hit in 1862 by her part of Mrs. Union in Friends or Foes. Other famous impersonations were as Monec in Up at the Hills, Blanche de Nevers in The Duke's Motto, and Mary Leigh in Boucicault's Hunted Down, and she also made the part of Alice in A Sister's Penance. She retired from the stage on her marriage, but reappeared in 1898 in The Master, produced by Mr. John Hare at the Globe. Ellen Terry was born in 1848, and made her as the be Tale in In 1867 she first played with ment. In 1807 She has played when Irving, taking the part of Katharina to his Petruchio in The Taming of the Shrew, and in 1875 scored a great success as Portia in The Merchant of Venice, which was revived at the Prince of Wales's Theatre under the management of the Bancrofts. also won great praise for her impersonation of Olivia in Goldsmith's Vicar of Wakefield in 1878, and the same year was engaged by Irving as leading lady at the Lyceum, subsequently appearing as Ophelia, Portia, Desdemona, Juliet, Beatrice, Viola, Lady Macbeth, Katharine in Henry VIII., Cordelia, Imogen, and Volumia in Coriolanus. She also played the title-part in Nance Oldfield in 1893. Rosamund in Becket in 1893, and Clarisse in Robespierre in 1899, and appeared with Mrs. Kendal in Tree's of The Mer revival Wives Windsor in 1902. Her stage jubilee was celebrated in 1906. See The Slory of my Life, 1908. Her sister Marion Terry (b. 1856) has also won a great reputation as an actress, notably in Lady Windermer's Fan, in which she re-appeared in 1911 at St. James's Theatre. Florence Terry (d. 1896) played in The Iron Chest with Irving, and was the original Little Nell of Halliday's play. Fred Terry (b. 1865) first appeared on the stage in 1880 under the Bancrofts.

He is well known with his wife, Julia

Old Drury, Hypatia, As You Like It, upon his conversion he was ordained The Scarlet Pimpernel, Henry of a presbyter, though where we are not Navarre, etc. His daughter Phyllis told. He himself speaks of having has already made a name as an actress in Shakespearian plays. Other members of the T. F. on the stage are: Beatrice Terry, daughter of Charles and nices of Ellen and Fred, who played Suzanne in the Scarlet Pimpernel in 1910 and Marie in Henry of Nature the same year, and has since toured with her uncle Fred T. Minnie Terry, eldest daughter of Charles, appeared in 1911 as Dora in Fanny's First Play.

Terschelling, an island in the North Sea, off the Netherlands, 16 m. long and 3 m. broad. Pop. 3996.

Tertian Fever, see MALARIA.

Tertiaries (Tertius ordo de pænitentia), associations of men and women living in the world but connected with certain religious orders, who practise the religious life as much as their state will allow. Such associations were first regularly formed by St. Francis of Assisi, and they have since produced much fruit. Previously he had founded two orders—the Friars Minor and the Poor Clares. Hence the name 'Third Order.'

Tertiary, in geology, a system which includes all the sedimentary accumulations formed between the close of Cretaceous time and the beginning of the Glacial Period. The system is divided into four groups, viz. Eocene, Oligocene, Miocene, and Pliocene, according to the percentages of recent mollusca contained. The strata of the system are of great lithological variety, and are found in the structure of all the continents and their great mountain chains. The Alps, Himalayas, Atlas, Carpathians, and Cordillera were formed in T. time. The T. crust movement was accompanied by

was at first warm and moist, gradually became colder and colder, and culminated in the glacial periods of the Pleistocene. See EOCENE,

Quintus (c. 160-

astical writers. He early characted the of different materials, as marble, profession of an advocate or rhetorician, in which he appears to have attained to some eminence. In all protessels were used to form the mosaic bability it was at Carthage that he was converted to Christianity, and Tessin. There are three eminent

a presbyter, though where we are not told. He himself speaks of having been at Rome, and we know that he could write Greek. His conversion His conversion probably took place about 190. About the end of the 2nd century he became a Montanist. Jerome ascribes this change to his suffering from the envy and insults of the clergy of the Roman Church, but a more adequate and more probable reason for it is to be found in the character of T. himself. T. holds one of the first places, if not the very first, among the Latin fathers for learning and intellectual power. His writings are apologetic, practical, and doctrinal. The best edition is that in the Vicana Corpus Scriptorum Ecclesiasticorum Latinorum, vol. xx. (1890). See also any works on Early Church History.

Teruel: 1. A prov. of N.E. Spain. covering an area of 5720 sq. m. It is extremely mountainous, the highest point being Mt. Javalambra, in the S. (6568 ft.). It has several large rivers, the principal being the Tagus, Guadalviar, and Guadaloupe. Chief products, corn, oil, wine, fruits, timber, etc.; and industries agriculture, mining, and weaving. Pop. 255,408.

2. Cap. of above prov. situated on the I. b. of the Guadalviar. Has a cathedral dating from the 16th century, and some fine churches, and is the seat of a bishopric. Pop. 11,000.

Teschen, a tn. of Silesia, Austria, 50 m. S.E. of Troppau, on the R. Olsa. Peace was made here in 1779 between Austria and Prussia. It has furniture factories and saw-mi'ls, and manufactures cloth, linen, spirits, etc. It is an old town, and has the remains of an ancient castle dating from the 12th century. Pop. 22,538.

Teshan, a tn. of Baulaluka circle, Bosnia, Austria, 62 m. from Sarajevo, with an active trade. Pop. 7000. Tesla, Nikola (b. 1857), an electrician and co-worker with Edison; of

Servian origin he emigrated to America in 1882. He is chiefly noted for the Tesla coil; this is of low selfinduction, but produces a rapid alternating oscillatory current capable of long distance transmission. It induces luminosity in a Tesla tube placed near. The currents have been experimented with for the cure of lupus.

Tesla Coil, see Tesla, Nikola. Tessera, or Tessela, a small cube or ecclesi- square resembling dice, and consisting

88), born at Stralsund, held the appointment of royal or crown archi- A complete edition was published in tect. One of his chief works is the 1899 by I. E. Rahmani, Patriarch palace of Drottningsholm, begun by of Antioch (at Mainz), and there is an integral to the complete chief. him for the queen-dowager Hedwig English translation by J. Cooper and Eleonora (widow of Charles Gustavus), A. J. Maclean (1902). but completed by his son. He also erected the royal villa of Strömsholm, and the mausoleum of Charles Gustavns.

Count Nicodemus Tessin (1654-1728), son of the above, was born at Nykö-ping. He was educated first at Stockholm, afterwards at Upsala, and then studied architecture at Rome under Bernini. He visited Naples, Sicily, and Malta, and returned to Rome, at which place he received from Sweden his appointment as court-architect in The destruction of the royal palace by fire in 1697 afforded him an opportunity to render the new edifice one of the noblest of its kind in Europe. He took a considerable share in public and political affairs.

Count Charles Guslavus Tessi

Tessin (1695-1771), the son of Count Nicodemus, was born at Stockholm; a statesman and diplomatist. He was ambassador at the court of France from 1739-42 and president of the chancery from 1747-52. He first established the Swedish Academy Painting and Sculpture in 1735.

Tessin, see TICINO.

Testacella, a genus of slugs characterised by a small external car-shaped shell at the tail end of the foot. not slimy, and lives underground, feeding at night time on earth worms

and grubs.

Test Acts: 1. By the Test Act, 1673, all officers, civil and military, were obliged within six months after appointment to make a declaration brown. against transubstantiation, take the sacrament in accordance with the pelled all nolders of municipal onices to take the sacrament—a provision aimed at the Presbyterians. Lord John Russell in 1828 carried a motion for their repeal. 2. The Parliamentary Test Act of 1678, which was passed after the perjured evidence of Titus Oates, and is now repealed, prohibited Roman Catholics from silting the Parliament sitting in Parliament.

Testament, see BIBLE, NEW TESTA-

MENT.

Testament, see WILL.
Testamentum Domini, a book of missiles dropped from above.
Church order of the 5th century,
Testudo, see Torroises. belonging to the same class of writings as the Apostolic Constitutions.

Swedes of this name, father, son, and was originally written in Greek, but grandson: is extant only in Arabic and Syriac, in Nicodemus Valentinson Tessin (1619-) which versions it occurs as the first

A. J. Maclean (1902).

Testelin (or Tettelin), Louis (1615-55), a French painter, executed an historical portrait of Louis XIV., but his finest pictures are the 'Resurrec-tion of Tabitha' and the 'Scourging of Paul,' both in the Church of Notre

Dame, Paris.

Testimony, see PERPETUATION OF

TESTIMONY.

Testing Clause, in Scots law, the technical name for the clause in written deed or other formal legal instrument which authenticates the document according to the forms of law. It contains the name and designation of the writer of the instrument, a record of the number of folios of which it consists, and the names and designations of the witnesses to the writer's signature.

Testing, Electric, see ELECTRICITY.
Test-papers are paper slips impregnated with some chemical reagent. Litmus papers are used for testing for acids and alkalies, acids turning the blue variety to a red colour and alkalies turning the red papers to a blue. Paper containing lead acctate is used as a test for hydrogen sulphide, which turns it brown. Oxidising agents, such as chlorine, ozone, etc., are tested for with papers containing potassium iodide and starch, which are turned blue in their precence. Turmeric paper, which is yellow in colour, is used as a test for alkalies and boric acid, which cause it to become

Testudinaria, or Elephant's Foot, a genus of deciduous climbing plants ceremony of the English Church, and (order Dioscoreacew), sometimes grown to take the oath of supremacy (q.v.).

This Act was usually conjoined with the Corporation Act, 1861, which compelled all holders of municipal offices it issue stems of great length bearing the control of the corporation and the corporation are supplied as the control of the corporation and the corporation are supplied as the corporation and the corporation are supplied as the corporation and the corporation are supplied as the corporation and the corporation are supplied as the corporation and the corporation are supplied as the corporation and the corporation are supplied as the co small greenish-yellow flowers. The roots are sometimes eaten by the Hottentots.

> Testudo, the technical name applied to a Roman military formation which was used when attacking fortified positions. The soldiers who were attacking raised their shields well above their heads and interlocked them. They were thus able to ap-proach the fortified position with them. little danger of being badly injured by

Testudo, see Torroises. Tetanus, or Lockjaw (from Gk. It reiver, to stretch), an infectious

disease is the introduction into a wound of the Bacillus Tetani. The existence of this micro-organism was demonstrated by Nicolaier in 1885, but a pure culture of it was first obtained by the Japanese scientist, Kitasato, in 1889. The germs are not themselves carried away in the bloodstream, but they set free toxins or poisons of unparalleled virulence, stream of a drop of a cultivated example having been known to kill a mouse. The toxin acts upon the cells of the central nervous system, and the voluntary muscles are very quickly out of the control of the sufferer. The bacillus of T. is found in soil, animal excrement, etc., and it obtains an entrance to the body through a wound which has become contaminated with There is no truth in the supposition that wounds in the thumb are particularly liable to set up tetanus. The duty of cleaning a wound which has come into contact with soil should never be neglected, as the development of the injurious toxin proceeds with fatal rapidity. The first sign of the disease is a feeling of stiffness at the back of the neck; the muscles of the jaw are then affected, with the result that the mouth is opened with difficulty, and afterwards becomes closely shut. The stiffening of the muscles proceeds to the body and limbs, until parts of the body become absolutely rigid to the touch. Besides the constant rigidity, there occur convulsions at intervals which may be as The muscles short as ten minutes. are then contracted with such violence that they may become ruptured or lead to the fracture of a bone. The absence of complete relaxation serves distinguish lockiaw from spasms associated with strychnine poisoning. The treatment of T. should commence with an effort to make the wound surgically clean. Morphia or chloroform should be used to lessen the pain caused by the spasms. T. antitoxin has been found useful as a prophylactic, but when a patient has been demonstrably attacked the development of the toxin has usually proceeded too far for any injection-treatment to be of avail.

Tethury, a tn. of Gloucestershire, England, 10 m. S.W. of Cirenesser, and S m. S.S.E. of Stroud. Trades in agriculture. Pop. (1911) 1758.

Teta or Tatte a tn. of Posturaces

Tete, or Tette, a tn. of Portuguese E. Africa, on the Zambesi. Formerly of some commercial importance, its trade has now somewhat declined. is 110 m. from Blantyre, and on the route of the telegraph line connecting that town with Salisbury.

disease characterised by violent mus-cular contractions. The cause of the is used to defend the entrance to a bridge.

Tethys (Τηθύς), in Greek mythology, was the daughter of Uranus and Grea, and the wife of Oceanus, by whom she was the mother of Oceanides and the river-gods. was also the instructress of Hera.

Teton, a mountain range of the ocky Mts., in Wyoming, U.S.A. Rocky Mts., in Wyoming, U.S.A. The highest peaks are Grand Teton (13,747 ft.) and Mt. Hayden (13,691

ft.).
Tetrabelodon, see Meritherium.

Tetrachord, see HARMONY. Tetradynamous, a botanical term applied to stamens which, as in the Crucifere, vary in length within the same flower, four being long and two short.

Tetragoniaceæ, a natural order of succulent plants and small shrubs. The best known species is Tetragonia expansa, the New Zealand spinach

(q.v.).
Tetragonolobus Edulis, or Winged
Pea, a Sicilian plant with quadrangular winged legumes which have been used as food.

Tetrahedron, see POLYHEDRON. Tetranthera, a genus of small trees (order Lauraceæ) with feather-veined leaves and umbels of small white and

rellow flowers. Tetrao, see BLACKCOCK, CAPER-

CAILZIE, and GROUSE.

Tetrarch, the ruler over the fourth part of a country. The term was borrowed by the Romans from the Greeks, with whom, however, it had quite a different meaning. On the of Herod the Great. death dominions were divided among Archelaus. Herod Antipas, and Herod laus, Herod Antipas, and Herod Philip. Part remained under the

direct rule of a Roman procurator.
Tetricus, Caius Pesuvius, the last of
the pretenders who ruled Gaul during its separation from the empire. He reigned from 267 to 274 A.D., when he was defeated by Aurelian at

Chalons.

Tetrodon, a genus of fishes, the teeth of which coalesce into upper and lower beaks divided by a median A considerable number of suture. species occur in tropical and subtropical seas, and one, T. lagocephalus, has been taken off British coasts.

Tetschen, a tn. of Bohemia, Austria, S3 m. N.N.E. of Prague, on the r. b. of the Elbe. Manufs. chemicals, sonp. cetton, flour, beer, etc. Pop. 10,641.
Totuan, a scaport of Morocco, on the Mediterranean, 40 m. S.E. by E.

of Tangier, and a few miles S. of the Strait of Gibraltar. The tn. is well 110 m. from Blantyre, and on the Strait of Gibraltar. The tn. is well ute of the telegraph line connecting at town with Salisbury.

Tete de Pont, a technical term in works, inlaying, and the manuf. of yellow slippers, and it exports fruit The and grain. Pop. about 25,000.

1455-1519). Tetzel, John (c. Dominican monk, who by the scandalous manner in which he carried on the traffic in indulgences roused indulgences roused Luther to precipitate the Reformation. This occurred in 1517. See Lives by Korner (1880) and Hermann (2nd ed. 1883).

Teucer (Τεῦκρος): 1. Son of the river-god Scamander and the nymph Idea, was the first king of Troy. The Trojans are sometimes called 'Teucri' after him. 2. Son of Telamon and step-brother of Ajax. He was celebrated for his archery among the Greeks.

Teucri, see TEUCER and TROY.

Teucrium, a genus of mostly per-ennial plants (order Labiatæ). The three British species are T. botrys (an annual), T. scordium, water ger-mander, and T. scordonia, the wood germander or wood sage, a common bitter plant which has been used as a substitute for hops. Teuffel, Wilhelm Sigismund (1820-

78), a German classical scholar, born at Ludwigsburg. He was appointed professor in the University of Tübingen in 1857, and held the post till his death. His magnum opus was Geschichte der Römischen Litteratur, 5th ed. 1890, English trans. by Warr, 1900.

Teutoburger-Wald, a range of hills in N.W. Germany extending along the borders of Hanover and Westphalia and through Lippe. greater part of the chain is densely wooded. Mt. Barnackow, in Lippe, is

the highest peak (1490 ft.).

Toutones, a tribe of northern Europe which in the time of Pytheas in habited the coasts of the northern ocean. They became known to the Romans in 103 B.C., and the following year were defeated, with the Ambrones, at Aque Sextie by Marius.

Teutonic Knights, one of the great

semi-religious orders of knights founded during the period of the crusades. The order originated in a brotherhood formed by certain German merchants of Bremen and Lübeck during the siege of Acre in 1190. A hospital was started, and thence came the foundation of the Teutonic Knights of the Hospital of St. Mary of Jerusalem. The new distinguished by a white cross, mantie with a black cross, was formed on the model of the Knights Hospitallers, and its members were also pledged to tend the sick, to protect the church, and to wage war against the heathen. In 1198 the hospital was turned into an order of 1471). Pop. (1911) 5287.

knighthood, and in 1237 it absorbed the order of the Brethren of the Sword. cities which are adjacent, one being

The Teutonic Knights conquered Lithuania and the Baltic regions of Prussia during the 13th and 14th centuries. Their defeat at the hands of the Poles and Lithuanians at Tannenberg struck a great blow at their prestige and the order declined rapidly. In 1525 the 'high master,' Albert of Brandenburg, was converted to Protestantism, and the order was secularised. Thus it continued till its suppression by Napoleon in 1809.

Teverone River (Italy), see ANIO. Teviot, a riv. in Roxburghshire, Scotland, rising in the S.W. and following a N.E. course of about 40 m., joining the Tweed at Kelso. Has good salmon and trout fishing.

Teviotdale, the name given to that part of Roxburghshire drained by

the Teviot and its tributaries.

Tewfik Pasha, Mohammed (1852-92), Khedive of Egypt. He was the eldest son of Ismail Pasha, and suc-ceded him in 1879. At that time Egyptian finances were under Anglo-French control, and the country was in a great state of unrest politically. In 1882 the rebellion of Arabi Pasha occurred which resulted in a British Protectorate being established and put an end to French influence. The revolt of the Mahdists in 1884-85 led to the loss of the Sudan and Upper Nile in spite of the British expeditions. T. had only one wife, Anima Hanem, whom he married in 1873.

Tewkesbury, a municipal and market tn. in Gloucestershire, England. It is situated on the Avon just where it is joined by the Severn, and is 10 m. N.E. of Gloucester. The abbey church dates from the 12th century (1125) and is a very beautiful building. It possesses a massive tower, and has a number of radiating choir chapels in the Decorated style, and a curious W. front, with an immense archway and window and a recessed porch. The interior contains some interesting monuments and some fine old glass. Ruins are all that remain of the great Benedictine abbey that once flourished here and dated back to Saxon times (c. 715). The town contains many other old buildings, including the grammar school, almshouses, etc. T. occupies school, anishouses, etc. 1. occupies the site of a Roman encampment, and in 1087 it was a borough and market. It received charters in the reigns of Edward III. Elizabeth, and William III. It was the scene of a battle during the Wars of the Roses, the the Varlitz under Edward IV. when the Yorkists under Edward IV. defeated the Lancastrians Margaret of Anjou, and the former was established on the throne (May

the co. seat of Miller co., Arkansas, all larger. U.S.A., and the other of Bowie co., Mexico til

Minner, cotton, cotton-seed, and on, while machinery, furniture, and rail-way engines are the chief manufs. Pop. (1910), T. in Texas, 9790; T. in Arkansas, 5055.

Texas, the largest (265.896 sq. m. in area) of the United States of N. America, and lies in the extreme S. W. with a cost-live along the America, and lies in the extreme S.W., with a coast-line along the Gulf of Mexico, stretching for 370 m. from Mexico N.E. to Louisiana. The general slope is N.W. to S.E. The Llano Estacado 'is a barren plateau in the W., with a mean elevation of from 3000-5000 ft. The descent to 1000 ft is swift and then come the 1000 ft. is swift, and then come the fertile tracts of rolling prairie, with plentiful forests of yellow pine in the E., and with fat pastures alternating with rich corn lands—tracts which extend terracewise to the fertile lowlands and barren swamps of the coastal belt. Behind Padre Is., which hugs the shore for over 100 m. northward from the mouth of the Rio Grande to that of the Nueces, is a region of white sands, known as 'the desert.' Sand bars block most of the harbours. With the exception of the Red and Arkansas, which carry their waters eastward to the Mississippi, all waters eastward to the Alssissippi, all the rivers, including the Brazos, Colorado, and Trinity, drain south-eastward to the Gulf of Mexico. T. is one of the great granaries of the world; maize is a long way the first crop, and after that come oats, wheat, crop, and atter that come outs, wheat, and rice. Cotton, tobacco, peaches, and sugar (in the Brazos delta) are also grown. Stock-raising is of vital importance, there being 3,000,000 swine, 2,000,000 sheep, over 1,000,000 horses, and the same number of milk cows. Petroleum is the most valuable mingral product, but the outputs of mineral product, but the outputs of clay, coal, and Portland cement are also considerable. Slaughter-houses and meat-packing stores, and after them flour and grist mills, are the most profitable industrial establish-ments. But lumbering and timbering and the manufacture of cotton-seed oil and cake are very thriving industries, whilst iron founding and the making of machinery and cars as well as rice cleaning are each year giving employment to more hands. The employment to more hands. The state is too vast to enjoy a uniform climate. The 'northers,' or biting hurricanes, hywever, which suddenly spring up add lower the temperature (aprhaps 20 for as long as three days, are a stylking feature. Morover, the air in the W. is remargiable for its dryness. The capital is Austin, but San Antonio (95.614 inhalitants in 1910), Dallas, Rouston Fort Worth, El Paso, and Galveston are

all larger. T. was associated with Mexico till 1836, and after ten years' U.S.A., and the other of Bovie co., Mexico till 1836, and after ten years' Texas. The chief articles of trade aro independence joined the American independence joined the American Union in 1845. Pop. (1910) 3,896,542. See D. G. Wooten (editor), A Comway engines are the chief manufs, Pop. (1910), T. in Texas, 9790; T. in Arkansas, 5655.

Texas, the largest (265,896 sq. m. Garrison, Texas, 1903, 1903, 1903, 1904,

Texeira, Joseph (1543-1604), a Portuguese historian, born in Lisbon. Having been admitted into the Dominican Order he became, in 1578, prior of the convent of Santarem. He supported the pretender Don Antonio against Philip II., and on his defeat accompanied him to France and afterwards to England. He wrote Flammula seu vexillo Sancii Dionusii: De Portugalliæ Orlu: Exegesis genealogica.

Texel, one of the W. Frisian Is., belonging to Holland. It is situated at the mouth of the Zuider Zee to the N. of Helder, from which it is separated by a channel 2 m. wide, and has an area of 71 sq. m. The northern end is called Eierland, or 'island of eggs,' in reference to the large number of seabirds' eggs which are found there. It was joined to T. by a sand-dike in 1630, and is now undistinguishable from the main island. The island is a great fishing centre for small herring, flat fish, anchovies, and shrimps, and produces fine breeds of sheep and cattle. Other industries are agriculture and boat-building. Off T. the English fleet under Monk defeated the Dutch under Van Tromp, who was killed in the action, 1653. Pop. 6255.

Textiles, see Fabrics, Textile.
Teynham, a vil. of Kent, England,
noted for its orchards. There are also

cement works here. Pop. (1911) 1800.
Tezcuco, or Texcoco, a tn. in
Mexico, situated near the Lako of Tezcuco and 16 m. E. of Mexico. is an old city and was originally the centre of the Aztec culture, some of its old buildings still remaining. It has now railway works and manufs. glass. Pop. 16,000.

Tezuitlan, a tn. in the state of nebla. Mexico, 72 m. N.E. of

Puebla, Mexico, 72 m. N.E. of Puebla. Pop. 11,000. Thaba N'Chu, a tn. in the Orange Free State, S. Africa, 36 m. from Bloemfontein.

drawings, in all of which his humour in monthly parts (1847-48). This and was apparent, and in 1833 he pur- Pendennis (1848-50) placed him in the chased and edited The National Stan- front rank of living novelists. He dard, a weekly paper that was unsuccessful. Having spent his patri-mony he now went to Paris to study art, and in 1836 published the amusdaily newspaper, the Constitutional. When that paper died in 1837, he having in the previous year married Isabella, daughter of Colonel Shawe, came to England and wrote for Fraser's Magazine and many other



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neriodicals. The Yel outplush Correspondence appeared in Fraser (1837-38). His married life came to a close in 1810, owing to his wife's insanity. In that year he published The Paris Sketch-book, and this was followed by Comic Tales and Sketches (1841) and The Irish Sketch-book (1843). There Great Hoggarty Diamond (1841) and Barry Lyndon (1846), the latter one of his greatest works. He was, however, still unknown to the general public, and first obtained recognition to the Scale of Greatest works. by The Snobs of England (1846), which was printed in Punch, to which he had contributed regularly since Levis M 1842. Mrs. Perkins' Ball (1847), a collarged Christmas book, brought him further popularity, but he did not become famous until the publication of Vanity Fair, which was brought out

front rank of living novelists. He lectured in London and the provinces on The English Humorists of the Eighteenth Century in 1851, and went to America to deliver the lectures there ing sketches Flore et Zephyr, and be shortly after Esmond was written came Paris correspondent of the (1852). The Newcomes was published 1853-55, and while it was coming out The Rose and the Ring, a delightful extravaganza, appeared (1854). T. lectured on The Four Georges in America and England in 1855 and 1856, and in the following year unsuccessfully contested Oxford in the The Virginians Liberal interest. came out in 1857-59, and in 1860 T became first editor of the Cornhill Magazine, to which he contributed Lovel the Widower (1860), The Adrendures of Philip (1861-62), and the delightful Roundabout Papers (1869-63). He resigned the editorship in 1862. 1862. At the time of his death, Christmas Eve, he was engaged upon Denis Dural, the fragment of which has been published (1864). T. is the lineal literary descendant of Henry Fielding, and is by many thought only to be second to him as an English novelist. His plots were often indifferent, except in the case of Esmond, the plan of which was carefully prepared, but his humour and satire are excellent, and his gift of characterisation and his knowledge of life give virility to all his writings. His best works are Vanity Fair. Pendennis, Esmond, and Barry Lyndon, while the Roundabout Papers are in their way inimitable, and his light verse at its best is of remarkable quality. T. illustrated most of his own writings, and though it is urged that he lacked distinction as an artist, no one disputes that as an illustrator he was other than successful. There was a delicious quaintness about his sketches, that for humour rival those of Cruikshank and Leech. There are numerous collected editions of his works. The first (22 vols.) appeared in 1867-69. His daughter, Lady Ritchie, issued a biographical edition (13 vols.), 1898-99, and this, with additions, was reprinted as the Centenary Edition (26 vols.) in 1911. The most complete edition, with all the original illustrations, is that of Lewis Melville (20 vols.), 1901-7. There is a monograph on T. in the Great Writers series by Herman Merivale and Sir Frank T. Mazials (1879), and a fuller biography by Lewis Mclville (1899; 5th and much ed., with claborate an A valuable by Mudge and valuable in 1910.

Tháddæus, see Judas.

tesan, who accompanied Alexander the Great on his expedition into Asia.

Thalamus, Torus, or Receptacle, the expanded apex of the pedicle or flower stalk from which the whorls or series of organs that compose a flower It is of great importance in the classification of flowering plants.

Thalassema, a genus of unsegmented marine worms of the group Gephyrea; some species perforate limestone.

Thalassinidæ, a family of macrourous decapods, with a long abdomen

and small compressed carapace. Thalberg, Sigismund (1812-71), a mposer and pianist, born at composer Geneva, studied under Hummel; became court planist in Vienna in 1830, and during the next ten years made highly successful appearances in Paris,

London, Holland, and Russia.

Thale, a vil., Saxony, Prussia, 36 m. W. of Magdeburg. Pop. 13,256. S.W. of Magdeburg. Thales (c. 640 B.C.), the father of Greek philosophy, and chief of the seven wise men, was a native of Miletus. He taught that water or moisture was the one element from which all things evolved. He appears to all things evolved. In appears to have owed much to the astronomy of the Egyptians and to the civilisation of Mesopotamia. Undoubtedly he was, however, the founder of abstract geometry, of the strict deductive form as shown in Euclid's collections: he is also said to have shown how to calculate the distance of a ship at sea, calculate the distance of a smip at sea, and the heights of objects. In astronomy he was credited by the ancients with the prediction of the total solar eclipse identified by Airy, Zech, and Hind with the date May 28, 585 n.c.; he is also said to have noted the 'Lesser Bear' and to have shown its superiority for the purposes of navigation.

Thalheim, a vil. of Saxony, 9 m. S.S.W. of Chemnitz. Manufs. cotton and woollen goods. Pop. 7711.

Thalia, one of the nine muses (q.v.); in later times the muse of comedy.

Thalictrum, or Meadow Rue, a genus of perennial plants (order Ranunculacce). Six species are British, the commonest of which is T. flavum, the yellow meadow rue, a tall plant with

bipinnate leaves and crowded pale yellow flowers.

Thallium (Tl, 2041) was discovered by Crookes (1861) in the seleniferous deposits from the sulphuric acid manufactory. It occurs in small quantities in iron pyrites, and also

crookesed by dis-

placement from its solutions of placement from its solutions of zinc. It forms a spongy mass which is fused beneath potas- and gun-boats. Sheerness and Shore-

Thais, a celebrated Athenian coursium cyanide. It is a soft heavy san, who accompanied Alexander metal (sp. gr., 11.2; melting point, 300°) which tarnishes in air forming a film of thallous oxide, while on exposure to air and hydroxide (TIOH) water thallous forms This latter is soluble in water, the solution absorbing carbon dioxide rapidly to give thallous carbonate. Two oxides of the metal are known, Theo and Theo, from which are derived the thallous and thallot salts.

Thallus, a body of simple structure. The term is commonly applied to the body of any plant belonging to the Thallophyta, one of the main divisions of the vegetable kingdom, and inclu-

of the vegetable kingdom, and incurding seaweeds, lichens, and fungi.

Thalwil, or Thalweil, a vil. in the canton of Zürich, Switzerland, 6 m., of Zürich and on the lake. Pop. 7724.

Thame: 1. A trib. of the Thames, England; it rises in Buckinghamshire, and joins the Thames on the l. b. near Wallingford. 2. An urban dist., England, 13 m. E. of Oxford, in the co. of Oxfordshire, Pop. (1911) 2957.

Thames, The, a river, England, rises near Greenesster in the Cotswold Hills and follows a course of some 190 m. to Gravesend, the head of the estuary, where it has a width of half a mile, gradually increasing then to 10 m. at the Nore lightship about

ne, Leach, and navigable for

canal to the Severn leaves. At Oxford the navigability improves, and the Wilts and Bucks Canal Joins a few miles down at Abingdon, the Wyc Canal leaving via the Konnet at Reading. From here barge and tug traffic, with important depots Reading and Kingston, is of importance, while river steamers ply be-tween the latter place and Oxford. Tidal waters are reached a few miles further at Teddington, the first lock from the sea except for the tidn) lock at Richmond. Until the Tower Bridge at Renmond. Until the Town Fridge was the lowest in the course, and occun-going vessels still reach the latter, the region being known as the Pool of London. Gravesond, 20 m. lower, grew up at the spot where vessels waited the turn of the tide. A little courter the Medicary by riting of the further the Medway, by virtue of its

the waters from here to the Nord lightship are of great strategic importance, hence there is here a station for destroyers, torpedo-boats, river is lined with docks and wharves, the former being now under the Port of London Authority. At Woolwich, on the south bank, 8 m, below London Bridge, is the arsenal, and a little further up the river Greenwich Observatory. Historically, the T. is unsurpassed by any river of the world. A slight rise surrounded by marsh on the left bank formed at the first point suitable for bridging a strategic site for London, the tide giving facilities to it as a port, while yet placed well up the river for defensive purposes. Still further up, a dominating site for the lower valley is found at Windsor for the medieval kings. In Anglo-Saxon times the kingdoms were divided by the river, and the break in the Chiltern Hills at Goring was a check in the line of aggression. Eton and Oxford are the greatest seats of learning throughout English history till the 19th century, the former under the shadow of the royal castle, the latter secluded, an ideal home for the peaceful pursuits of learning. The T. was once much learning. The T. was once much larger, and in the remote past probably followed a course through a large plain, now the North Sea, where it joined the Rhine and Elbe, forming a mighty river embouching into the Norwegian Sea.

Thames and Severn Canal, leaves the Thames at Lechlade, and reaches Stroud, 30 m. N.W. The North Wilts Canal communicates with it at Cricklade, and the Stroudwater Canal from the Severn at Stroud. It runs through the counties of Wilts and Gloucester-

shire.

Thames Conservancy. The duty of maintaining the purity of the Thames and regulating the navigation gener-ally is vested in the Thames Conservancy Board, a body which came into existence in 1857. Prior to that date the duties relative to the lower part of the river devolved upon the Corporation of London, those relative to the upper part upon the Upper Thames Commissioners. The Thames Conservancy Act of 1857 transferred Conservancy Act of 1857 transferred the powers and duties of those two bodies to the Thames Conservators, the members of which beard were increased by the Consolidating Act of 1894. This Act provides for the appointment of thirty-eight conservators, thirty-one to be nominated by the Board of Trade, the Admiralty, Trinity House the councils of the Trinity House, the councils of the various counties through which the river flows, and the old metropolitan water companies, seven to be the proby Thames shipowners, dock proby wharfingers. From water companies, seven to be elected

ham as land defences add to this. Cricklade is subject to the jurisdiction From London Bridge downwards the of the Thames Conservancy Board, but the Port of London water (so much as lies between Yantlett Creek much as lies between Yantlett Creek and London Bridge) is regulated: (1) By the board as to all matters not specially delegated to any other public body; (2) by Trinity House as to pilotage and lighting matters; (3) by the Port Sanitary Authority as to sanitary matters; (4) by the Board of Trade as to registration of ships; and (5) by the London County Council as to piers and landing places. The whole of the river above Teddington Lock towards its source is exclusively governed by the byelaws of the Thames Conservancy Board. The principal duties of the board have to do with the preservation from pollution of the river, both in the main stream and in tributaries, docks, and canals, the protection of fisheries and

Thames Ditton, a vil. of Surrey, England, opposite Hampton Court Palace, on the R. Thames. Pop. (1911) 5000.

Thana, see TANNA.

Thane, or Thegn, a title of honour in the Anglo-Saxon nobility. Originally the term was applied to the personal followers of the kings and signified a minister or honourable Ts. among other royal retainer. household officers were chosen to be advisers of the king as distinct from the general assembly of the Wilan. Later the thegnhood developed into a powerful territorial nobility with royal grants of Sac and Soc (i.e., right to hold a court for one's tenants and the right to the amercements received from such court, respectively). The early institution of the thegn-hood suggested to the Norman kings the military system based on the ut apart from

the fyrd or of emergency.

The Ts. did not hold their lands on condition of military service as did the tenants by knight service, but received them rather as a reward for past services.

Thanet, Isle of, a one time island now part of the mainland in the co. of Kent. The watering places of Ramsgate and Margate are both situated here. At Ebbsfleet St. Augustine is supposed originally to have landed in 597, and in 449 Hengist and Horsa. Jutish sea pirates are supposed to have landed also.

Thanet Sands, the lowest division of the Eocene system (q.v.) and exposed in the London basin. They are well shown in the Isle of Thanet, and by Thames shipowners, dock pro-prietors, and wharfingers. From Scalaria, Bowerbankil, and Phola-Yantlett Creek the river as far as domya Koninckii.

Thanksgiving Day, an annual festival of thanksgiving in the annual United States, now always cele-brated, according to the choice of President Lincoln in 1864, on the last Thursday in November. It is in essence a national harvest celebration, and was first observed by the Pilgrim Fathers at Plymouth in 1621, after they had gathered in their first harvest.

harvest.
Thann, a tn. in Alsace, Germany,
21 m. S.S.W. of Colmar. It has a
Gothic church dating from the
14th century, and is also engaged in
manufacturing silk and cotton goods
and machinery. Pop. 7414.
Thapsia, or Deadly Carrot, a genus
of perennial plants (order Umbelilfere) with a carrot-like root and
umbels of yellow flowers, and large
doubly or trebly pinnate leaves of
considerable decorative value.

considerable decorative value.

Thar and Parkar, a dist. in the E. of Sindh, Bombay. It divides naturally into two parts—the fertile plain of Nara and a dry and desert region. The administrative headquarty and the service of the se ters are at Umarkot. Pop. 389,000.

Tharawadi, a district of Lower Burma, in the Pegu division. The cap. is T., 68 m. N.W. of Rangoon. Area, 2851 sq. m. Pop. (district) 396,000; (town) 6000.

Thases, or Thasus, an island in the N. of the Ægean Sea, off the coast of Thrace. It was early taken possession of by the Phœnicians, on account of its valuable gold mines. T. was afterwards colonised by the Parians, 708 B.C., and among the colonists was the possessed a considerable terrionco possessed a considerable territory on the coast of Thrace, and were one of the richest and most powerful peoples in the N. of the Ægean. They were subdued by the Persians under Mardonius, and subsequently became part of the Athenian maritime became part of the Athenian maritime empire. They revolted, however, from Athens in 465 B.C., and after sustaining a siege of three years, were subdued by Cimon in 463. They again revolted from Athens in 411, and called in the Spartans, but the island was again restored to the Athenian by Thrasybulus in 407.

island was again restored to the Athenians by Thrasybulus in 407.

Thaton, a tn. of Lower Burma, in the Tenasserim district, formerly a scaport, and the capital of the Talaing kingdom—nawebaut 10 kingdom-now about 10 m. from the

sea. Pop. 15,000.

Thaumatrope, see Zoetrope.
Thaxted, a tn. of Essex, England, on the Chelmer, 18 m. N. W. of Chelmsford.
Pop. (1911) 1600.

Thayet-myo, the cap, of the dist, of T., Lower Burma, on the Irawadi, 38 m. N.N.W. of Prome. The chief products are rice, cotton, and cotton seeds. Pop. 16,000.

Theagenes: Theagenes: 1. (excayers.) was tyrant of Megara. He obtained his position about 630 B.C. by espousing the cause of the people against the nobility, but was ultimately driven out. 2. The son of Timosthenes, and a native of Thasos (A. 480 B.C.). He was a renowned athlete and gained was a renowned athlete and gained 1. (Θεαγένης.) numerous victories at the Olympian.

Pythian, and Isthmian games. Theatines, a religious order in the Romish Church, so called from their principal founder John Peter Caraffa, then bishop of Theate, or Chiefl, in the kingdom of Naples, and afterwards pope, under the name of Paul IV., in 1524. This order was the first which vainly endeavoured, by its example, to revive among the clery the poverty of the apostles and first disciples of our Saviour.

Théâtre Français, see Comédie

FRANCAISE.

Theatres, Laws Relating to. By the Theatres Act, 1843, all theatres the Theatres Act, 1843, all theatres for the 'performance of stage-plays' must be licensed. Stage-play by section 23 includes 'every tragedy, comedy, farce, opera, burletta, interlude, melodrama, pantomime, or other entertainment of the stage.' But, 'says Mr. Strong (Dramatic and Musical Law), 'it required no less a person than "Pepper's ghost" to appear in a court of justice in order to get a decision of this definition.' get a decision of this definition. ballet divertissement which merely consists of poses and evolutions by a number of elegant ladies' is not, but a ballet d'action, which usually has but a ballet a action, when usually has in it the shadow of a regular dramatic story, is, a 'stage play' for the purposes of licensing law. The Lord Chamberlain is the licensing authority as to all theatres (except patent theatres, the only existing example of which is Covent Gardon) within the artifumentary houndaries of London parliamentary boundaries of London and Westminster, and in the boroughs of Finsbury, Marylebone, Tower Hamlets, Lambeth, Southwark, New Windsor, and Brighton. In county boroughs the licences are granted by the town councils, in non-county boroughs by the county council, while the L.C.C. is the authority for those parts of London which are not within the turn of the county that we have the county that the transfer of the county that we have the county that the transfer of the county that the county within the jurisdiction of the Lord Chamberlain. A licence granted to the manager of the theatre only. (As to licensing of plays, see CENSORSHIP OF THE DRAMA.) Keep-ing a 'theatre' without a licence representing for hire a stage play in an unlicensed place, a daily penalty of £10; performing a new play without the leave of the censor, £50, and avoidance of the theatre licence. The law on the subject of employing children on the stage is contained in

the Children Act, 1908 (q.v.). The proper course where it is desired to put a child on the stage is to obtain the leave of a magistrate. In Scotland, leave of a magistrate. where the fitness of a child for training is proved, the petty sessional court will grant a licence allowing it to be trained for the stage, provided the court is satisfied that provision has been made to secure kind treatment. Music AND DANCING See also LICENCES.

Thebaine (C₁₀H₂₁NO₂), one of the alkaloids contained in opium in combination with meconic acid. It is very poisonous, causing severe convulsions. It gives a blood-red colouration with

concentrated sulphuric acid.

Thebarton, a tn. in S. Australia, about 1 m. N.W. of Adelaide, of which it is a suburb. It is engaged in leather

Pop. 7000. tanning. Thebes (Gk. OnBat, Heb. No-Amon), the name of an ancient city of Upper Egypt, which was then known as Thebais. It survives to-day in the splendid array of ruins at Karnak and T. was founded in remote Luxor. antiquity, probably under the 1st dynasty, and sprang into prominence in the 11th dynasty. The city consisted of two main portious, separated by the Nile, each part extending from the bank of the river to the base of the hills which envelop the valley of the Nile. Its site is now marked by the villages of Luxor and Karnak on the eastern side, and by Gournou and Medinet-Abu on the western. Its most flourishing period appears to have been about 1600 B.C., when it was the capital of all Egypt. Its cir-cumference was estimated by Diodorus Siculus to be about 17 m. was the residence for several centurics of Egyptian kings, whose tombs have since been discovered. During have since been discovered. During the reigns of the Ptolemies T. was neglected and Memphis became the capital. In 525 B.C. T. was partly burned by the Persians under Cambyses, and in 86 B.C. it was captured and plundered by the Greeks. The buildings and sculptures still extant are the most events and the least are the most ancient and the best specimens of Egyptian art and archi-For a description of the tecture. monuments that remain, consult Baedeker's Egypt, and works by Flinders Petric (1897) and Naville (1894 - 1906).

Thebes (Gk. OnBai), the chief city Beeotia in ancient Greece. position was well defended, since it was situated in the middle of a plain surrounded by mountains. We find the conquest by the Bœotians about as "the year 1100 B.C. T. then became the rei! chief city of a confederation. Later with we find the city in contest with Athens, which is prohibited by natural law.

and again supporting Persia owing to Persian invasions. She became the closest ally of the Spartans, and dur-ing the Peloponnesian War was Athens' bitterest foc. At the close of the war, however, she allied with Athens against Sparta, but the town was conquered and garrisoned by the Spartans. After the battle of Leuctra (371 B.c.) for a short time she became the most powerful state in Greece. She was defeated and captured by the Macedonians, and utterly destroyed by Alexander the Great (335 B.c.). The town was restored about 315 B.C., but never again rose to occupy a position of importance. The present population is about 3200.

Thecla, a virgin saint of the early church. She was a member of a noble family of Iconium in Lycaonia, where she was converted by the preaching of St. Paul. She suffered many persecutions, and is styled in the Greek martyrologies the proto-martyress, as Stephen is the proto-martyr. She is said to have died at the age of ninety

in Seleucia.

Theed, William (1804-91), a sculp-r, the son of Wm. Theed, R.A. (1764-1817). Having studied at the Royal Academy and in Italy under Thorvaldsen and others, he executed many well-known statues, busts, etc., including the Africa group on the

Albert Memorial.

Theft. In most communities, ancient and modern, the institution of private property has occasioned the formulation of copious laws for the redress of violations by T. of the exclusive rights of ownership. But in an age of ungoverned violence, when legislators or law-givers had not as yet attained to the conception of the preservation of public order for its own sake, the legal code of an aucient state reflected a very different view of the moral aspect of stealing from the modern view, or even from that of the earliest (hristianised communities. Maine asserts with a great show of probability that the ancient Roman and Grecian codes had no real law of crimes at all, and that such penal laws as they do reveal are no more than the law of wrongs or torts (see TORT). The wrong recognised by The first civil the Twelve Tables was that of furtum (T.), and even assaults and violent robbery were no more than delicts (torts). All such wrongs gave rise to an obligation or vincutum juris, the fulfilment of which was considered complete surrounded by mountains. We find with the payment of money. T. is our first historical trace of the city in defined in the *Institutes* of Justinian trectutio tself, or

This definition affords some striking form of dishonesty treated of in the points of resemblance to most modern definitions of stealing (cf. that of larceny in English law, under LARCENY); e.g. the word contrectatio imparts the notion of touching or handling (see TRESPASS), while fraudulosa indicates that to constitute T. the thing must be seized with evil intent. The

that extension as apocryphal, and it is almost certain that the idea of gain was not implicit in the Roman defini-tion of T., and that the taking of another's goods out of mere spite or to destroy them was enough. This assumption seems warranted by a later passage in the Institutes which provides that it is T. 'not only when any one takes away a thing belonging to another, in order to appropriate it, but generally when any one deals with the property of another contrary to the wishes of its owner. Thus if any one borrows a horse as for a ride, and takes it . . . into battle.'
Though, whether by reason of the
influence of Christian ideas or the attainment of a more subtle analysis of motive, the text continues, person, however, who borrows a thing and applies it to a purpose other than that for which it was lent, only com-mits T. if he knows he is acting against the wishes of the owner, ... for there is no T. without the intention to commit T. In England, the doctrine of the King's Peace was the foundation of T. as a public wrong; on the continent it is to be traced to the source of Naturecht or Natural Law (see Jurisprudence), the first effect of which upon T. is to be found Roman Institutes, the which characterise furtum as an act pro-hibited by natural law. (See also Jus GENTIUM.) The Anglo-Saxon laws of Inc, Athelstan, and others respecting the punishment of T. reveal a curious compromise between the Draconian severity of a pagan state and the mildness inculcated by the Christian missions from Ron death was nominally the punishm in cases of T. where the value of article taken exceeded 12d; but in practice the thief could always compound his offence by a fine. Up to comparatively recent times, however, felonious T. remained a capital offence (see CAPITAL PUNISHMENT). At the present time T. connotes a variety of cognate but distinct offences, varying from larceny (q.v.) to fraudulent breach of trust. In this connection it is instructive to recall with Maine the erroneous inference drawn by many from the fact that the only after the French Revolution devoted

most ancient Roman law is T. (meaning thereby larceny). See also BURGLARY, EMBEZZLEMENT, FAISE PRETENCES, and LARCENY.

Theine, see Caffeine

Theiner, Augustin (1804-74), a German Roman Catholic historian, was born at Breslau. After wavering in his religious views, he returned to the Church of Rome in 1833, and was afterwards made a priest of that communion and a member of the oratory. He wrote Geschichte des Pontificals Clemens XIV. (1853), and published an edition of the Annals of Baronius (1864)

Theiss (Hungarian Tisza), the most important Hungarian riv., rises in two head-streams on the slopes of the Carpathians, where it is known as the White T. and the Black T. It takes a winding course, generally in a W. or S.W. direction, to empty its waters into the Danube near Titel, after receiving the Szamos, Maros, Körös, Sajó, and Latorcza. Length \$20 m.

Thelemark a mountainous region

Thelemark, a mountainous region in the district of Bratsberg, Norway. The culminating point is Gausta

(6200 ft.).
Thellusson Act. By this Act (1800) no accumulation of rents or property, whether real or personal, may by any instrument be directed for longer than one or other (and one only) of the following periods, viz. (1) life of one or other (and one only) of the following periods, viz. (1) life of settlor, or (2) twenty-one years after, or (3) minority of any person in being at the death of the settlor or testator, or (4) minority of any person who, if of full age, would, under the deed or will, be entitled to the rents and profits. Any accumulation exceeding profits. Any accumulation exceeding the statutory period is bad only to the extent of the excess and not in lolo as under the rule against perpetuities (q.v. and sec Land Laws). The Act does not apply to provisions (1) for payment of debts, (2) for raising positions (q.v.), or (3) concerning produce of timber. The Act was passed in convenions of the Arthropium of the Arthrop in consequence of the extraordinary will of one Mr. Thellusson, who harshly directed the income of his property during the lives of

grand- and great-io were living at the some future descendants to be living

at the decease of the survivor, thus keeping within the letter of the rule of perpetuities which allowed any number of existing lives to be taken as the period for an executory interest. See ACCUMULATION.

Tholwall, John (1764-1834), an English author and reformer, born in London. He wrote Poems on Various Subjects (1787), and other works; but himself to politics, and joined the Cornelius Nepos, monograph by Bauer Friends of the People. He was (1881), and Grote's History of Greece arrested in 1794 but was acquitted. (ed. by Mitchell and Caspary, 1907). In later life he became a lecturer on elocution, and in 1814 published a work on Defective Utterance.

Themis, in Greek mythology, was the daughter of Uranus and Gea, and by Zeus the mother of Eunomia, Diké, and Eirené. Themistius (c. 317-387 A.D.), an Oriental philosopher and rhetorician,

Themis

was a native of Paphlagonia. He settled in Constantinople about 347 where he became a senator (355) and prefect (384). He wrote paraphrases of various works of Aristotle. editio princeps is that of Aldus (Venice, See editions of Dindorf (1832) and Spengel (1866), and Baret's De Themistic Sophista (1853).

Themistocles (c. 514-449 B.C.), an Athenian soldier and statesman, was of a middle-class family, being the son of one Neocles. Little is known of his early life, but he was ambitious from childhood, and in his unscrupu-lousness differed greatly from his rival, Aristides, who was ostracised in 482. T. advocated naval expendi-Athens from Persian invasion, and through his influence 100 new through his influence 100 new triremes were constructed and the port moved from Phaleron to Piræus. During 493-492, the years of his archonship, T. was the first man in the state, and for the next ten years exercised almost unlimited power. Though the Spartan Eurybiades was nominally in command of the navy, it was T. who forced the engagement at Artemisium to take place. Seeing that Eurybiades was wavering and un-willing to fight, T. sent a message to Xorxes that unless he attacked at once the Greeks would make good their escape. The Persians, accord-ingly, blocked the western exit of the bay with 200 ships, so that a battle was inevitable, and the glory of the battle of Salamis (483) fell to T. On the retirement of the Persians, he rebuilt the walls of Athens and strengthened the fortress and harbour of Pircus, throwing dust in the eyes of Sparta until the work was practically completed. He also removed the herokaov, an alien's tax, and thus encouraged many foreign traders to settle in Athens. He soon appears to have lost his influence with the Athenians, probably on account of his arrogant manners, and about 471 was ostracised and banished from Athens. He retired to Argos, where he was Greek Poets, chap. xxi. falsely accused of treason, and then fled to Corcyra, and finally was welcomed by Artaxerxes. He settled in at Phaselis. His father Aristander Magnesia, where he lived till his caused him to study under Plato, death. See Lives by Plutarch and Isocrates, and possibly Aristotle, who

Thénard, Louis Jacques, Baron de (1777-1857), a French chemist, studied under Fourcroy and Nauquelin. He was professor of chemistry at the Collège de France (1804), and at the Ecole Polytechnique and Faculté des Sciences (1810). T. improved the process of manufacturing white lead. His works include: Traité de Chimie

faring of mediante, 1813physico-1811.

.44). editor of Shakespeare, and translator. He had a first place in *The Dunciad* for his criticism of Pope's edition. T. produced in 1734 an edition of Shakespeare which gave him a high place among his editors.

Theobroma, a genus of small trees (order Sterculiacem) bearing clusters of flowers with a rose-coloured calyx and yellow petals, followed by long, broad yellow fruits with elevated longitudinal ribs. The most imlongitudinal ribs. The most important species is T. cacao, the cacao

or cocoa plant. See Cocoa.

Theobromine (C,H₈N₄O₂) occurs in cocoa beans, and is obtained by treating with lime and extracting with It crystallises from water alcohol. and resembles caffeine in properties (caffeine=methyl-theobromine).

Theocracy (Gk. θεοκρατία, government by God), a term applied to the constitution of the Israelitish government as established by Moses, on account of its being under the direct control of Yahweh.

Theocritus, the celebrated bucolic poet, was a native of Syracuse, and the son of Praxagoras and Philinna. He visited Alexandria during the latter end of the reign of Ptolemy Soter, where he received the instruction of Philetas and Asclepiades, and began to distinguish himself as a His first efforts obtained for him the patronage of Ptolemy Philadelphus, in whose praise the poet wrote the 14th, 15th, and 17th Idylls. T. was the creator of bucolic poetry as a branch of Greek, and through imitators, such as Virgil, of Roman literature. The bucolic idylls of T. are of a dramatic and mimetic character, and are pictures of the ordinary life of the common people of Sicily. See Fritzsche (with Latin notes), Kynas-ton, and Cholmeley. Translations: Andrew Lang (prose); Calverley, The Idylls (verse). Cf. Symonds, The Greek Poets, chap. xxi.

Theodectes (c. 376-335 B.C.), a Greek orator and tragic poet, born at Phaselis. His father Aristander

dedicated to him one of his treatises | King Theodore I. His short period of rhetoric. He also wrote several orations and poems on the art of oratory.

Theodelinda (fl. 589-625), Queen of the Lombards, daughter of the Duke of Bavaria. She became the consort of Antharis, and did much to intro-duce Christianity into Lombard Italy.

Theodicy (Θεός, God, and δίκη, justice), the vindication of the justice and goodness of God in the creation and government of the world. See works on the subject by Benedict (1822), Von Schaden (1842), J. Young (2nd ed. 1861), etc.

Theodolite, the most important of the instruments used in surveying, by

which the measurement of angles, vertical, but especially horizontal, is performed. It consists of a telescope mounted so as to move on two graduated circles, one of which is horizontal, and the other vertical. The axes of the telescope pass through the centres of these two circles. The instrument is carefully adjusted on a pedestal, which when in use stands upon a tripod stand. An elaborate arrangement of screws and plates enables the T. to be adjusted with "hough the

tical and only can

For the measurement of vertical angles a levelling instrument is more accurate. There are three main types of T.—the Everest, the Y-pattern, and the transit—but the differences between them do not essentially affect netween them do not essentially affect the construction. It is important to notice a change that has been made in graduating Ts. Until recently, British Ts. were divided into degrees, of which 360 made the complete circle, but they are now frequently made with the French centesimal graduation in which the circle is divided into 400 divisions. divided into 400 divisions.

Theodora (c. 508-548 A.D.), wife of the Byzantine emperor Justinian, notorious before her marriage as an actress and dancer of ill-repute, was proclaimed empress in 527. She showed high courage in the Nika insurrection (532), and was an able goursellor in all matters of state.

counsellor in all matters of state. Theodore (1690-1756), 'King of Corsica,' Baron de Neuhoff, born at Metz. Early left an orphan, he served France and Sweden as a soldier, and helped in a plot to re-establish the Stuarts in England, but his plot was discovered, and he had to flee. He later served Alperoni. Marrying an English wife, he stole her jewels and deserted her. He entered the service of Charles VI., who appointed him resident at Florence. He headed a Corsican rising (1738), and was proclaimed as

of government was able and energetic. Deposed by the Genoese (1738), he came to London, was imprisoned for dobt, but was liberated through the good offices of H. Walpole, and died there.

Theodore of Abyssinia, see Anys-

SINIA.
Theodore of Mopsuestia (c. 350-428), a learned bishop and biblical scholar of the Eastern Church, born at Antioch. He was the leader of the Antiochene or literal school of exegesis. See editions of various parts of his extant works by Fritzscho (1847), Swete (1880-82), Mai (1832 and 1854), and Sachan (1869).

Theodoretus, or Theodoritus (c. 393-457 A.D.), was brought up under the care of a pious mother, and had in-struction from Theodore of Mopsuestia and John Chrysostom in a monastery. T. became a deacon in the church at Antioch, and in 423 was chosen bishop of Cyrus, a city in Syria. Against the opinions of the heretics he directed his efforts with so heretics he directed his efforts with so much success that, according to his own statement, he baptised 10,000 Marcionites. In 431, when Nestorius was condemned by the Council of Ephesus (see NESTORIANS), T. was one of those who assembled and condemned its proceedings. He warmly protested when John, patriarch of Antioch, gave his consent to the condemnation of Nestorius. In 449 T. was deposed from his hishoric and demnation of Nestorius. In 449 T. was deposed from his bishopric, and he was compelled to retire into the monastery where he had been educated. In 451, however, an eccumenical council was assembled, to which cal council was assembled, to which T. was summoned. By condemning Nestorius he was restored to his bishopric. His works were: A History of the Church, from 325 to 429; Φιλόβεος ίστορία; Ten Orations against the Heathen; an Apology for Christianity; besides 146 letters and commentaries on books of the O.T. and on the original of St. Paul. and and on the epistles of St. Paul; and some others.

Theodoric (or Theoderic) I., King of the ., and of Ala warred 40, defeating them at rollious (439),

son, became King of the Visigotias (452-66), after murdering the elder

on Theudemir's death (c. 474), T., after some raids against the Emperor Zeno and a rival Gothic chieftain, set zeno and a rival Gothic chieftain, set out to win Italy from Odoacer, whom he defeated at Verona. The conquest was delayed by treachery, and Ravenna, whither Odoacer had fled, was besieged. At last there was a capitulation, which T. violated by slaying Odoacer (493). T.'s thirty-three years' reign was a period of peace and prosperity for Italy. He maintained his traditional Arian creed but was impartial in religious creed, but was impartial in religious matters. He figures in the Nibelunmatters. He figures in the Nibelun-genlied, being known to the Germans as Dietrich von Berne (Verona).

Theodorus (fl. 4th century), a Greek philosopher of the Cyrenaic school, was a pupil of Arete, the daughter of Aristippus. He wrote a work on the gods, Περὶ θεῶν, which brought him

into disrepute as an atheist.

Theodorus Lascaris, the name of two emperors of Nicæa. Theodore I. was Emperors of Niema. Intender I. was born about 1175, and was crowned Emperor of Niema in 1206, waging war against the Latins both before and after. He died in 1222. His grandson, Theodore II., came to the throne in 1255. His reign was spent chiefly in conflict with the Bulgarians.

Theodosius, an able Roman general of the reign of Valentinian I. He fought against the barbarians of Britain and Germany (367), and crushed a Moorish insurrection in Africa (373). The reason of his Africa (373). The reason of his execution at Carthage (376) is unknown. His son was the Emperor

Theodosius the Great.

Theodosius I., Flavius, the Great (b. c. 346 A.D.), a Roman soldier, born in Spain, son of General T. (d. 376). He became Roman emperor of the East (c. 378-95). T. entered the Christian tian church, and was noted for his zeal against the Arians. He warred successfully against the Goths, con-cluding peace with them (382). With them as allies and with the Huns, he defeated(383-88) the usurper Maximus who had laid claim to Gratian's empire, and secured the throne of the West for Gratian's brother, Valen-tinian II. After the latter's death (392) T. became sole emperor (394). The cruel massacre by means of which he avenged the riot at Thessalonica (390) has branded his name with infamy. St. Ambrose, Arch-blshop of Milan, persuaded him to undergo penance in order to be cleansed from his sin. T. divided his empire between his sons, Honorius

stantinople, and soon after his return and Arcadius, the former ruling the to his father, Theudemir, attacked the king of the Sarmatians and captured Singidunum (Belgrade). Theudemir and his son now successfully demir and his son now successfully Ecclesiastica; Tillemont, Hist. des invaded Moesia and Macedonia, and Empereurs; Le Beau, Hist. du Bastrale de Moesia de Capture de Captur Empire; Hodgkin's Dynasty of Theodosius, 1889.

Theodosius II. (401-50), grandson of ' Theodosius II. (401-50), grandson of T. the Great, and son of Arcadius, succeeding him as emperor of the East (408). His sister, Pulcheria, and the prætorian prefect, Anthemius, ruled during his minority. Wars with the Persians (421-41) and the Huns under Attila (441-48) were among the chief events of his reign. The Codex Theodosianus, a collection of Imperial Constitutions in 16 books, was published in 438. See Gerlach, De Theodosius Juniore, 1751; Güldenpenning, Gesch. des oströmischen Reiches unter Arkadius und Theodosius II., 1885; Mommsen and Meyer, Theodosii Libri XVI., 1904-5.

Theodosius of Bithynia, a mathematician mentioned by Strabo and Vitruvius, who calls him the inventor of a universal sun-dial (ix. 9). He lived before the time of Augustus, but is often wrongly confused with

Theodule, St., an Alpine pass, 10,896 ft. in height, which connects Val Tournanche in Piedmont, Italy, with Zermatt in the Niklausthal, Switzerland. It is always snow-

covered. Theognis of Megara (b. c. 540 B.c.), an elegiac and gnomic poet, was by birth a noble. He was deprived of all his property and shared the exile of the oligarchical party. The greater part of his poems were composed during his period of exile. He is the best preserved of the Greek elegists, and owes his fame chiefly to his maxims. See Introduction to Prof.

H. Williams's ed. of Theogmis, 1910. Theogony (Gk. Θεός, God; γόνος, seed), a genealogy of the gods. Many early Greek poets wrote verse theo-gonies, of which only one, that of Hesiod, is extant.

Theology (Lat. theologia, from Gk. θεολόγια, speaking concerning God), a term widely, but somewhat in-accurately, used as equivalent to religion. T. is the science of religion, dealing therefore with God, and man in his relations to God. The term may be still further restricted to mean be still further restricted to mean systematic T., in which department it deals with the specific doctrines, principles, and characteristics of Christianity alone. T. is treated under two main heads: Natural and Revealed T., and until the last contury it was usual to keep the two subjects strictly apart. subjects strictly apart. Various causes, chief of which is the applica-

tion of the theory of evolution to Aristotelian philosophy, giving his religion and T., have conspired to do attention specially to natural history away with hard and fast divisions of and to botany. His chief works inthis kind. Modern thought, in T. as clude treatises on politics, legislators, elsewhere, strives to minimise the importance or deny the existence of critical points in the world's history, and to trace instead an orderly development. It is evident that without an entire break with historic Christianity, no such change can take place with regard to dogmatic T. place with regard to together there, however, the influences have taken the shape of a tendency to the taken the shape of the tendency together deastic restatement. Restatement is, of course, no new thing in T.; it is, indeed, necessary to its existence as a science. Moreover, though its working is on different lines, it is doubtful whether the modern restatement is any more complete than that which culminated in the Summa Theologia of Aquinas. By the comparison of this great work with the book Foundation, published in 1912 by Seven Oxford Men, some idea of the nature of the change that has taken place may easily gathered.

Theon, Ælius (fl. 4th century A.D.), Alexandrian grammarian, the author of Programasmata (Προγυμνάσματια), which lays down practical rules on rhetoric. It was first published at Rome in 1520. Consult Walz, Rhetores Graci, vol. i.

the Elder, a native and a contemporary Theon Smyrna, Ptolemy. He was a follower of Plato, and wrote a mathematical treatise, part of which was edited by De Gelder in 1827.

Theon the Younger, of Alexandria, also a Platonist, flourished in the latter half of the 4th century; was the father of Hypatia, who was murdered by the populace of Alexandria (415 A.D.). He wrote commentaries on Ptolemy, Euclid, and Syntaxis.

Theophany, a manifestation of him-self by God to men, especially that

given in Jesus. Theophilanthropism, a religion de-vised in Paris during the Revolution period (1796) to replace the abolished

Christianity. Theophilus (f. 2nd century A.D.), with the upper and middle strings a bishop of Antioch, for Christianity (sec

Theophrastus (c. 372-287 B.C Greek philosopher, born at Eres Lesbos. He was the pupil of and Aristotle in Athens, and o death of the latter became he... the Peripatetic school, which drew dependence of truths upon one large numbers of pupils from all another. When thus understood, it parts. He was a close follower of the lis at once evident that the opposition

clude treatises on politics, legislators, laws, metaphysics, the senses and the

biblical commentator. biblical commentator. He became archbishop of Achrida in Bulgaria (c. 1078-1107). T. was a deacon at Constantinople and tutor of Constantinople and tutor of Constantinople. He became Constantinopie and cutor of constantine Porphyrogenitus, son of Michael VII. He wrote lackia Barthri (Education of Princes), commentaries on the Minor Prophets, and other works. See De Rossi's edition of his Works (1754-63). Consult Krumbacher, Byzantinische Litteraturgeschichte (2nd ed., 1897).

Theophylactus, Simocatta (c. 580. 630 A.D.), a Byzantine historian of Egyptian race. He held public posts under Heraelius at Constantinople from 610 onwards. T. wrote a history of the Emperor Maurice (582-602); 'America drocká (Quæstiones Physica); and eighty-four Letters (Morales,

Boissonado (1886) for the

Quæstiones. Theopompus of Chios (b. c. 378 B.C.), a celebrated Greek historian, studied rhetoric under Isocrates at Chios. He slared the exile which his father had incurred by espousing the Lacedemonian cause, but was restored to his country in 333 B.C. He then took a leading part in politics on the aristocratic side, and raised a host of enemies, among whom was the sophist Theocritus. About 305 B.C. he was expelled from Chios and fied to Egypt. Nothing is known of his further fate. T. composed histories and orations, but none of his works are extant. He is praised by the ancients for his diligence and accuracy. See Bury's Ancient Greck Historics (1909).

Theorbo, :.

resembling a

used as an voice. It had two heads or nuts,

ngs to the upper one. for Christianity (see getarum, vol. viii., 1861). To him, too, is sometimes matteributed a commentary on the attributed a commentary on the Gosnels.

a problem states is to be done. orly speaking, seen and known the

many cases because so few Ts. are perfect. A perfect T. harmonises with all the facts and completely fulfils its work. An imperfect T. is fils its work. An imperfect T. is always inadequate, and is often definitely wrong. Hence it is that the common distinction between fact and T. has arisen. In another sense a distinction is made between T. and practice, but here again the distinction is largely due to the prevalence of imperfect Ts. Those who are anxious to make this distinction, understand by practice the application of that knowledge which comes from experience only, and is not sufficiently connected with any general principles to be entitled to the name of a T. But the distinction between theoretical and practical labourers in the field of science or art is not strictly a just one, for there is no theorist whose knowledge is all T., and there is no practical man whose skill is all derived from experience. Regarding, however, the higher class of men to whom one would apply the terms theoretical and practical, one sees that there are obvious faults to which both parties are subject.

Theosophy, meaning divine wisdom, dates from a very high antiquity, coming down to us from the Neoplatonists, Plotinus, Iamblichus, and Proclus. Numbered among them also are Paracelsus, Boehme, and Proclus. and the Rosicrucians. In the East also T. is of very ancient origin, the Sanr. is or very ancient origin, the Sanskrit equivalent being Brahma-Vidya, or divine knowledge. It is closely allied to mysticism, and involves a belief in one absolute incomprehensible and supreme deity, which is the root of all nature, and of all that is visible and invisible, a belief in man's eternal nature which heing a radioeternal nature, which, being a radia-tion of the universal soul, is of an identical essence with it, and a belief that by returning to the purity of nature, one can gain certain occult T. has always had as an aim the reconciliation of all religions and nations under a common system of ethics. Helena Petrovna Blavatsky (1831-91), a Russian princess, who it is claimed was initiated in Tibet, is the recognised founder of the two great branches of to-day. T. is supposed to be preserved by initiates contend over the world with the second over the world with t to found the Theosophical Society in History of Greece, vol. iv.

frequently made between facts and 1875. Its teachings in general may Ts. is an incorrect one. The T. is be said to be founded on the two merely the co-ordination and interpretation of facts, based on them and in a way containing them. An opposition, however, has really arisen in the also reap —and Reincarnotion, or the bolist that man must undergo the belief that man must undergo a series of lives until he has assimilated all the soul experiences and can attain to Nirvana. The terminology and the thoughts seem to the Western and the thoughts seem to the research to be Buddhistic, but it is claimed that T. is not Buddhism. After H. P. Blavatsky died, W. G. Judge, of America, became the leader, and upon his death the society split into two sections, one following Mrs. Katherine Tingley, and the other Mrs. Annie Besant. See H. P. Blavatsky, The Key to Theosophy, Isis Unveiled, The Besant. Secret Doctrine.

Theotocopuli, Domenico (surnamed El Greco) (c. 1545-1625), a Spanish painter and sculptor, probably a pupil of Titian. In 1577 he was living at Toledo in Spain, and painted 'The Parting of Christ's Raiments 'for the cathedral there, and 'The Entombment of Count Orgaz, 1323' for the church of Santo Tome (1584). His 'Saint Jerome' is in the National Gallery, London. T. constructed and decorated the church and monastery of the Bernardine monks at San Domenico di Silvos, and designed the church of the Augustines at Madrid.

or Santorin, a volcanic Thera, or Santorin, a volcanic island in the Ægean Sea, one of the cyclades. It forms with the island of Therasia and the islet of Aspronesi a ring, the crater of the volcano, in the midst of which lie three small islands, Palæa, Mikra, and Nea Kaumene. The highest point of T. is Mt. Elias (1910 ft.), which ex-isted before the volcano was formed. The modern town of Thera is built at a height of 900 ft. on the cliffs, which rise perpendicularly from the water, and the foundations of the houses are excavated in the tufa, or other volcanic strata. Numerous rock carvings and inscriptions have been discovered, and near the foot of Mt. Elias is the temple of Thea Basileia. T. was important in ancient history, having colonised Cyrene on the N. coast of Africa in 631 R.c.

Theramenes, an Athenian, son of Hagnon, was a leading member of the oligarchical government of the 400 at Athens, in 411 B.C. Subsequently. however, he not only took a prominent part in the deposition of the 400, but came forward as the accuser of Antiattained spiritual perfection, but been his intimate friends. After the attained spiritual perfection, but been his intimate friends. After the attained spiritual perfection A capture of Athens by Lysander, group of these Arhats, Mahatmas, or Theramenes was chosen one of the Masters, it is said, led H. P. Blavatsky Thirty Tyrants (404). See Thirlwall,

Therapeutæ, an ascetic sect akin to the Essenes, described in an anonymous work once ascribed to Philo Judeus (Concerning the Contemplative Life). This work is now

templative 1190,.
held to be a forgery.
Therapeusis, Or Therapy, that branch of the science of medicine which deals with the cure of disease, the relief of certain symptoms, or the prevention of their occurrence by various agencies. Remedial agencies are divided into classes, according to general similarity of treatment, e.g. aerotherapeutics (q.v.), balneotherapeutics (q.v.), electro-psychic theratherapeutics (q.v.), peutics or hypnotism, serum therapeutics (q.v.), vaccine therapeutics (q.v.), hydrotherapeutics or hydropathy (q.v.), etc.

Theresa, St., see Teresa.

Theresienstadt, a tn. in Bohemia, on the Eger, near its confluence with the Elbe, 32 m. N.N.W. of Prague, and 17 m. from Teplitz. It is the principal fortified place in Bohemia. Pop. 6094.

Theresopolis, a colony of Brazil (German), situated in the state of Santa Catharina, 34 m. S.W. of

Desterro. Pop. 2500.

Therezina, a tn. of Brazil, in the prov. of Plauhy, of which it is the capital. The manufacture of cotton thread, etc., is extensively carried on. Pop. 25,000.

Theriaca, a pharmacological term for treacle or molasses. The word is derived from a wild beast, the compounds originally known as theriace being supposed to act as antidotes to poisonous bites. T. andromacht, or Venice treacle, contains seventy ingredients; its invention is ascribed to Andromachus, Nero's physician.

Therm, the British thermal unit (B.Th.U.). It is the amount of heat

required to raise one pound of water through 1° F. (from 60° to 61° F.), and equals 251.9 calories (q.v.).

Thermæ were the huge buildings erected by the Roman emperors, and comprised not only baths of various that the other libraries grammasis. comprised not only bains of varieties, indis, but often libraries, gynnasia, theatres, etc. The different varieties of baths which were taken, and the rooms, were briefly as follows: The apartment for undressing was the silver, which is protected by poorly apartment the alint apodyterium; the alipt

arium was a room for in the frigidarium we

Thermia, or Kythnos, one of the chief islands of the Cyclades, Greece, situated in the Bay of Hagia Irini. It possesses mineral springs, which are much frequented in the summer.

Thermidor (from Gk. θέρμη, heat, and δώρον, gift), a month in the Republican calendar, introduced at the time of the French Revolution. It extended from July 19 to August 18.

Thermit, or Thermite, a mixture of finely powdered aluminium and oxide of iron ('hammer scale,' Fe,O,), the heat of combustion of which produces a temperature of about 3000° C. It was invented by Mr. Claude Vanten of London and utilised for welding by lum oxide . lu is · tho ends of the rans or plates to be joined. The hot iron and slag raise the temperature of the ends to welding

heat and metallic iron is deposited in the interstice. Thus on pressing together a perfect joint is made, dispensing with fish plates and electric connections in electric traction rails. The mixture is also used for welding steel tubes and for mending iron castings. Oxides of other metals can be substituted for iron oxide, whereby the pure metal can be obtained as well as many valuable alloys by using

mixed oxides.

Thermo-chemistry is the science, founded on the law of the conservation of energy, which deals with the thermal effects accompanying chemical actions. Reactions in which heat is evolved are called 'exo-thermic,' and where heat is absorbed endothermic. they are termed Measurements of the heat of formation of substances, the heat of solution, of combustion, and of the neutralisation of acids and bases, have been determined. The amount of heat liberated in chemical reaction is determined by allowing it to warm a known quantity of liquid (generally water) whose specific heat is known, and measuring the rise of temperature by means of an accurate thermometer.

heat by radiation. The rostances, either in the pure olution, are brought to the

and in the caudariun

The tepidarium was a warm room, same temperature and introduced with no bath, in which the bather wisually spent some time before unsually spent some time before undressing. T. were built by the emperors Agrippa (21 B.C.), Nero (65), perors Agrippa (21 B.C.), Nero (65), Titus (81), Domitian (95), etc.

Thermal Unit, see Calorie.

a reaction may be studied thermochemically, it must take place at ordinary temperatures, and must proceed rapidly to the end. Many reactions which do not fulfil these conditions, such as many processes of combustion, can be made to fulfil them. This is done by causing the substance to be burnt, in the presence of oxygen under increased pressure, in a steel bomb lined with platinum or enamel. Only in a comparatively few cases has it been possible to make direct determinations of the heat value of chemical changes. Thermal values, which cannot be determined directly, can be calculated indirectly by methods depending on the fundamental principle of thermo-chemistry which was propounded by Hess (1840). This principle, known as the constancy of the heat sum, may be stated thus: The heat evolved in a chemical process is the same whether it takes place in one or in several stages. The heat change, therefore, is dependent only on the initial and final stages of the reaction or system of reaction. Thus the heat of formation of methane cannot be determined directly, but a value may be arrived at by subtracting the heat evolved when methane is burnt from that evolved when the corresponding weights of free carbon and hydrogen are burnt. The unit of heat used in thermo-chemical measurements is the calorie, or the quantity of heat which is required to raise 1 gram of water from 0° to 1° C. The results of thermo-chemical measurements are expressed by symbols, which mean gram-atomic, or, in the case of compounds, gram-molecular weights of the substances which react. Thus $H_1 + O = H_2O + 68360$ calories means that 68,360 calories of heat are liberated when 2 grams of hydrogen and 16 grams of water unite at ordinary temperatures to form 18 grams of water. If the reacting substances are in solution, the presence of a large quantity of water is denoted by the symbol aq—thus: KOHaq + HClaq=KClaq+13700 calories. As well as being of theoretical importance, thermo-chemistry has been found of great value in determining the heating power of fuels for commercial purposes. See H. C. Jones, Elements of Physical Chemistry, 1907; Scott, Introduction to Chemical Theory, 1801. Thermo-Chemie, 1891; Naumann.

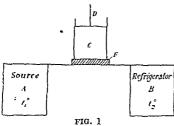
Thermodynamics, as the name suggests, deals with the relations be-

calorimeter), the amount of heat algebraic equation W=JH, where W liberated is determined. In order that is the work done, H the heat absorbed is the work done, H the heat absorbed or given out, and J is a constant called the mechanical equivalent of heat. This law then asserts that when work is converted into heat, the heat produced is definitely proportional to the work expended, and rice versa if heat is used to do work a quantity of heat disappears proportional to the work Joule and others spent condoné. siderable time and labour in ascertaining the exact value of J. The value now generally accepted as correct is 4.19×10' in the C.G.S. system. This first law is based on the dynamical theory of heat, i.e. that heat is a form

of energy. Joule's experiments were published in 1843 and 1878. Carnot's work. - In 1824 Carnot published his famous essay, The Molive Power of Heat. Previous to this time the undulatory theory of light had been firmly established, yet the galorietheory of heat still held its own. Carnot worked on the caloric theory, although before his death there is no doubt that he had grasped the idea of the dynamical theory. Carnot's work was unnoticed until Clapeyron, ten years after its publication, cleared up what was faulty in Carnot's reasoning. Any arrangement for the transformation of heat into mechanical energy is termed a heat engine. The latter consists essentially of three parts: (1) The source of heat; (2) the working sub-stance; (3) the refrigerator. In the common steam engine the working substance is the water and steam. Heat is communicated to it from the sides of the boiler. The heat is partly converted into work, and the rest given up to the condenser.

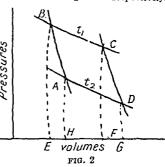
Carnot's cucle.-Carnot imagined an ideal engine in which no heat was lost by friction. In fact he considered a cycle of operations each of which was reversible. Supposing we have a cylinder C with perfectly non-conducting sides, a perfectly conducting bottom, and fitted with a frictionless, non-conducting piston D. The cylinder C can be placed either on a non-conducting slab F, or in connection with the conducting source A at temperature t_i° , or the refrigerator B at temperature t_i° . Let the cylinder contain air, or any other working substance under pressure. This pressure is applied by the piston and can be altered at will. Let the working substance be put through a series of changes known as Carnot's cycle, and let those changes be represented by means of Watt's indicator diagram (q.v.). Suppose the working substance tween heat and work. The modern to be in the condition, initially, represcience is based on two fundamental sented by A. Place it on the slab F principles. Joule expressed what is and compress it adiabatically, i.e. now the first fundamental law by the without gain or loss of heat, by gradu-

ally reducing the load on the piston cycle. There are two conditions to be until the state B is reached. The fulfilled ere the process is reversible substance will have passed through (1) That when the W.S. is taking heat until the state B is reached. The substance will have passed through a series of conditions represented by a series of continuous represented a, the line AB. Now place the cylinder in connection with A, and allow it to expand slowly to condition C by releasing the load on D, the piston. In general the substance would cool by such an expansion. But it is kept at constant temperature by heaf. H. constant temperature by heaf absorbed from the source A. process must be slow so that the temperature of the working substance (W.S.) is never sensibly below that of the source. The series of conditions will be represented by the isothermal line BC. Now place the cylinder back on the sleb F and allow it to expand a little more adiabatically. No heat is communicated to it from outside so that the W.S. will



cool. Let it cool to a temperature t2° along the adiabatic CD. Place the atong the adjanator CD. Place the cylinder in connection with the refrigerator at to and slowly compress the W.S. by increasing the load on the piston. The substance would warm under the compression, but since it is in contact with the refrigerator and its temperature is proported by the transport of the contact with the refrigerator and its temperature is never sensibly above t_2^{**} , it gives up an amount of heat H_2 to it. Suppose the W.S. has then returned to its initial state A, along the isothermal DA. The area ABCD represents the The area ABCD represents the balance of work done by the W.S., because work BCFE is done by the substance along BC, and work CDGF along CD. When the substance is contracting along DA and AB, work DG, HA, and HEBA, respectively, is done on it. Thus the balance of work done by the W.S. is represented by the area ABCD (see Indicator diagrams). Heat H, is taken from the source and heat H, given up to the refrigerator. Thus the work done must equal the difference between H₁ and H₂. The process is reversible, i.e. we could have worked around the cycle ABCD in the direction DCDAD. In each part of the cycle the work

from the source or giving heat to the refrigerator its temperature must be sensibly the same as that of the source and refrigerator respectively.



(2) That the pressure exerted by the W.S. on the piston should be sensibly the same as the load on the piston. These conditions imply that the cycle must be traversed very slowly. quantity of ice at 0° under atmospheric pressure is an example of a reversible Slightly increase the pressure and the ice will melt, release it and the ice is formed again. Ice thrown into water at 10° C. is an example of an irreversible process. No process we know of will change the water back to ice at 10° C. We showed above that W, the work done, is equal to H₁-H₂, the difference be-tween heat taken from source and heat given to the refrigerator. The

where Q is the mechanical equivalent of the heat taken from the source, i.c. Q=JH. Thus E=JH. Lord Kelvin, Clausius, and others continued to Clausius, and others continued to work on the lines laid down by Carnot, and Kelvin and Clausius both formulated the second law of thermo-

efficiency of an engine is equal to

dynamics on slightly different terms. In simple language the law states that we cannot transform heat into work merely by coaling a body already at its lowest available temperature. It is easy to show that all reversible proplets reading between the coaling a posture reading the state of the coaling a posture reading between the coaling and the coaling a posture reading between the coaling terms. engines working between two given temperatures, and taking in equal quantities of heat from the source are equally efficient. Let A and B be the two engines, of which A is the more efficient. Let A work forwards efficient. Let A work forwards taking heat H from the source and giving H, to the refrigerator. Let B work backwards giving heat H to the done would be equal and opposite to work backwards giving heat H to the that done in the direct working of the source and taking H, from the refrigerator. Since A is more efficient H₁>H₂. There is a balance of work done equal to $J(H_2-H_1)$, and this comes from the refrigerator, since B restores what heat A takes from the source. Work cannot be done by taking heat from a body at its lowest available temperature. The refrigerator is at lowest available. frigerator is at its lowest available temperature. Thus H, must equal H, and the engines are equally efficient. It is an easy extension to prove that all reversible engines working be-tween the same temperatures are equally efficient, no matter what heat is taken from the source.

Kelvin's absolute scale.—The above Kelvin's absolute scale.—The above proof may be expressed by saying that the efficiency of an engine depends only on the temperatures between which it is working, and not on the W.S. Kelvin devised an absolute scale of temperature from absolute scale of temperature from consideration of this fact. Supposing consideration of this fact. Supposing a quantity of heat (Q) were sent down a number of temperature steps, the quantity lessening as each step is passed by the conversion of some

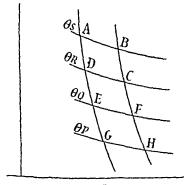


FIG. 3

heat into work, the temperature steps would be equal on Kelvin's scale if an equal amount of work were expended at each step. Let \$\theta_s\$, \$\theta_r\$, etc., be a series of isothermals (the tempera-tures taken on Kelvin's scale). Let AG and BH be two adiabatics. Let an engine working round the cycle ABCD take heat Qs from the source and give Qn to the refrigerator. Then work Qs-QR would be done, equal to area ABCD. Let another engine work round the cycle DCFE, taking heat QR from the source and giving Qq to the refrigerator. Work QR - QQ would be done, equal to area DCFE. QQ to the retrigerator. Work QR \sim QQ Let the gas have the initial condition would be done, equal to area DCFE. Similarly let engines work between all the temperatures θP , θS . In the isothermal θ . Let the gas expand all the temperatures θP , θS . In the isothermal θ . Let the gas expand all the temperatures θP , θS and θP until its temperature is θP . Then

. . . the temperature intervals $\theta s - \theta R$, $\theta R - \theta Q$, etc., are equal on Kelvin's scale. The efficiency on such a scale $\theta \Im - \theta \mathbf{R}$ Supposing the above process were continued until no heat were left to be expended as work, we should have reached the zero on Kelvin's scale. The efficiency depends only on the difference of temperature of source and refrigerator. $E=A(\theta s-\theta R)$, where A is a constant and θs and θR the temperatures of the source and refrigerator respectively.

But E=Qs-QR Let the process be Qs taken on until all the heat is used up. $\theta_{R}=0$ in such a case, and $E=A\theta_{S}$. But $E = \frac{QS - QR}{S} = 1$, since QR is 0. But $E = \frac{e_S}{QS} = 1$, since QR is 0. Thus $A = \frac{1}{\theta S}$. Therefore the efficiency

is equal to $\frac{\theta S - \theta R}{\theta S}$. Since $E = \frac{QS - QR}{QS}$ $\frac{\theta S - \theta R}{\theta S}$, then $\frac{QS}{\theta S} = \frac{QR}{\theta R}$. It has been found that for a perfect gas Kelvin's scale agrees with the gas scale. By a perfect gas is meant one that obeys Boyle's, Charles's, and Joule's laws. The two former are dealt with in HEAT. The latter states that a perfect

remains constant in temperature. Applications of thermodynamics.
(a) To gases.—For a gas that obeys
Boyle's law PV=RT, where P=the
pressure, V=volume, T the absolute
temperature, i.e. temperature on
Kelvin's scale, and R is a constant.

gas that expands and does no work

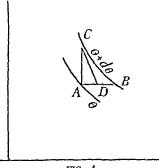


FIG. 4

We shall first prove that the ratio of the specific heats for a gas is equal to the ratio of the two elasticities. 212

contract it along the isothermal for adiabatic expansion. For isothermal $(\theta + d\theta)$. Finally allow it to be commal expansion the same term holds, pressed at constant volume to its final state. Let the change of pressure along AC be dp, and the change of volume along AB be dv. Draw the adiabatic through C meeting AB in D. The isothermal elasticity Et is by definition equal

to v× change of pressure along CB change of volume along CB

$$\therefore E\theta = v \times \frac{AC}{AB}.$$

Similarly the adiabatic elasticity AC $E\phi = AB$ _ AB $E\phi = v \times \frac{AC}{AD}$ Thus $\mathbf{E}\theta$ ĀD

Heat received along AB Heat received along AD

Heat received along AB

Heat received along AC since CD is an adiabatic and area ACD is very small. Thus $\frac{E\phi}{E\theta} = \frac{Kpd\theta}{Kvd\theta}$ where Kp, Kv are the specific heats at constant pressure and constant volume respectively.

$$\therefore \frac{\mathbf{E}\phi}{\mathbf{E}\theta} = \frac{\mathbf{K}p}{\mathbf{K}v} = \gamma \text{ (say)}.$$

Difference of specific heats.—Consider the cycle ACB in Fig. 4. The heat sater the dyster ACB at right 1 the float taken in by the working substances is $Kvd\theta$ along AC, and Ldv along CB. L is the latent heat of dilatation. Heat $Kyd\theta$ is given out along BA. The algebraic sum of the heat taken The algorian sum of the next taken in is equal to the work done, i.e. to area ACB. This area is negligible. Thus $Kvd\theta+Ldv-Kpd\theta=0$. For a perfect gas L=P (the pressure) and $PV=R\theta$. Differentiating we have that $Pdv = Rd\theta$.

$$\therefore \mathbf{K} v d\theta + \mathbf{P} dv - \mathbf{K} p d\theta = 0.$$

 \therefore Kpd θ - Kvd θ = Rd θ , i.e. Kp - Kv = R;

$$\therefore \mathbb{K}v = \frac{\mathbb{R}}{\gamma - 1}.$$

Work done during an isothermal expansion.—The work done in any expansion is $\int pdv$. If the body (the gas) expands from v_1 to v_2 the work

done is
$$\int_{v_1}^{v_2} p dv$$
. Now PV = constant,

$$\therefore \text{ work done} = \int_{v_1}^{v_2} \frac{pvdv}{v} = P_1 V_1 \int_{v_1}^{v_2} \frac{v_2 dv}{v}$$

$$= P_1 \nabla_1 \log_e \frac{\nabla_2}{\nabla_1} = RT \log \frac{\nabla_2}{\nabla_1}$$

An amount of heat equal to the above must be supplied to the gas in the expansion since it is isothermal. Adiabatic expansion.-We have

shown that $\frac{E\phi}{E\theta} = \gamma$. Now $E\phi = \frac{vdp}{dv_1}$ gram. Therefore $(v_1 - v_1)dp = \frac{Ld\theta}{\theta}$;

 $E\theta = \frac{vdp}{dv}$. In an isothermal expansion the equation PV=RT=constant is valid also. Differentiating we get Pdv+rdp=0. Thus $-\frac{vdp}{dv} = P = -Ee$. $\therefore E\phi = \frac{vdp}{dv} = \gamma E\theta = -\gamma P$.

$$\therefore E\phi = \frac{vdp}{dv} = \gamma E\theta = -\gamma P.$$

For an adiabatic expansion, then, the equation $\frac{vdp}{dv} + \gamma P = 0$ holds. solution of the equation is PVy= constant, and this is the equation for adiabatic expansion.

Applications to change of state in solutions.—If a substance can exist, under suitable pressure and volume, in two states, the indicator diagram shows that the isothermals are horizontal. Take water and steam as an illustration. In Fig. 5 AB is the

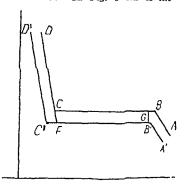


FIG. 5

isothermal for steam at θ' (approximately 100° C.). At B water begins to form. BC is the isothermal for a mixture of steam and water. At Call steam is condensed, and CD is the isothermal for water. A'B'C'D' is a similar curve for 0-d0. From C and B take adiabatics BG and CF. Consider unit mass, 1 gram, of the water taken round the cycle CBB'F. Let v. and v. be the specific volumes of water and steam. Heat taken in along CB is L, the heat of evaporation at θ° . The efficiency is $\frac{W}{H} = \frac{d\theta}{\theta}$. Thus

work done = $\frac{\mathbf{H}d\theta}{\theta} = \frac{d\theta}{\theta} = \operatorname{arca}$ CBGF.

This area is equal to $(v_i - v_i dp,$ since it is approximately a parallelo-

equation for the latent heat. If $v_z > v_i$, is positive and vice versá. Thus for steam the boiling point rises with

Entropy.—If at a temperature θ a body takes in heat H, there is said to be a change of entropy $\frac{11}{\mu}$. We proved in the paragraph on Kelvin's scale that $\frac{Qs}{\theta s} = \frac{Qn}{\partial R}$, etc. Thus when we pass from one adiabatic to another along any isothermal the change in entropy is the same. This change of entropy is used to distinguish adiabatics, just as change of temperature is used to distinguish isothermals. No heat is lost or absorbed when a body expands adiabatically. Thus an adiabatic is a line of constant entropy. It is a universal law that entropy is tending to a maximum. In any change of heat energy from one body to another there is gain, never loss, of entropy. For example, suppose a warm body is placed into contact with a cold body until they finally attain the same temperature θ . Let the warm body lose heat Q to the colder body. The loss of entropy by the hot body is $<\frac{Q}{\theta}$, because its average temperature is $> \theta$. The gain of entropy of the cold body is $>_{\widehat{\theta}}^{\mathbf{Q}}$ since its average temperature is $<\theta$. Thus altogether there is gain of

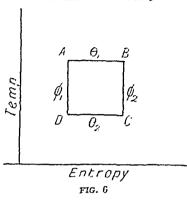
Expression for work done in terms of entropy.—Work done in Carnot's cycle= $W=Q_1-Q_2$, where Q_1 is the units of heat absorbed at θ_1 , and Q_2 those at θ_2 . Let ϕ_1 , ϕ_2 be the entropies corresponding to the two adiabatics in Carnot's cycle.

 $\phi_1 - \phi_2 = \frac{Q_1}{\theta_1} = \frac{Q_2}{\theta_2}$, \therefore work done = $Q_1 - Q_2$

 $= (\theta_1 - \theta_2)(\phi_1 - \phi_2).$

Temperature - entropy diagrams. The condition of a substance is often suitably defined by its entropy and temperature, and not by its pressure, volume and temperature. Equal increments of entropy are marked along the horizontal axis, and temperature along the vertical axis. Fig. 6 shows a Carnot's cycle on this dia-As stated before, the adiabatics BC and DA are lines of constant entropy or isentropics. The isothermals are of course horizontal. We get, then, such a cycle as ABCD. along DA is $C_1d\theta$, where C_1 is the Workdone in the cycle $=(\theta_1-\theta_2)(\phi_1-\phi_2)$ specific heat of the sate given out along diagrams are of use in determining BC is $C_2d\theta$, where C_2 is the specific

... $\frac{1}{\theta} = (v_1 - v_1) \frac{dp}{d\theta}$, the well-known the efficiency of steam-engines working under various conditions. For a fuller account of these methods, readers are advised to consult such works as Rankine's Steam Engine.

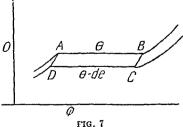


entropy to thermodynamical problems.—For a reversible cycle \int_{a}^{dQ} is 0, because $\frac{Q}{\theta}$ is constant at all parts of the cycle. Another expression for the latent heat of water can be obtained from the entropy-temperature

Application of the principles of

diagram. Let a gram of water be taken round the same cycle as in Fig. 5. We proved before that the work done in the cycle CBB'F in Fig. 5 was $Ld\theta$ Fig. 7 is an entropytemperature diagram for steam and

water, under the same conditions as



Heat taken in along AB is L. That given out along before. (Fig. 7) is L. $dLd\theta$ CD is (L -The heat taken in heat of the substance in the second | boiling point as 80° on his scale. $\left(\frac{d\mathbf{L}}{d\theta} + \mathbf{C_1} - \mathbf{C_2}\right) d\theta$. and this is also the heat taken

in, $\therefore \frac{dL}{d\theta} + C_1 - C_2 = \frac{L}{\theta}$. second latent heat equation. recent years the science of thermodynamics has been vastly employed in problems of radiation. For these more advanced problems the reader is referred to the original papers in the

Phil. Trans. and elsewhere.
Thermo-electricity, see Electri-

CITY. Thermograph, an instrument used for automatically recording the flucto automatically recording one nuc-tuations in the temperature of the air. The 'Richard' pattern of thermo-graph consists of a curved metal tube containing a suitable liquid. Rise or fall of temperature respectively straightens or increases the curvature of the tube by the alteration in the volume of the liquid. The movement is transmitted by levers to a pen, which makes a trace on a revolving drum. The photographic thermograph of the Meteorological Committee consists of a revolving drum of prepared paper on which is photographed the position of a bubble of air introduced into the mercury column and which moves up and down with

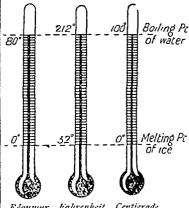
and Thermometry. Thermometer The thermometer is an instrument for measuring temperature (q.v.). Galileo was the first to use one, but his was not sealed. Ferdinand II., Grand Duke of Tuscany, was the inventor of a sealed and graduated thermometer. He filled a bulb and

the temperature.

tube with alcohol and sealed off the latter whilst the alcohol was warm. Mercurial thermometers made their appearance about 1655. Fahrenheit constructed his thermometer, the pattern of which has survived to this day, in 1714. His zero point was found by immersing the thermometer in a mixture of ice and salammoniac. He found the freezing point of water by immersing the thermometer in a mixture of ice and He also determined the boilwater. ing point of water and the blood tem-

ng point of water and the blood temperature of human beings. The boiling point of water he called 312°, the freezing point was then 32°. The intermediate space between these points he divided into 180 equal parts. The Fahrenheit scale is still in general use. Two other theregoneter scales are frequently used. mometer scales are frequently used:
(1) Réaumur's scale, and (2) Centigrade scale. Réaumur took the freez-

the substance in the second points point as 50° on his scale. Thus total heat taken in is The intervening space he divided into 80° equal parts and called them degrees. The Centigrade scale was and this is also the heat taken of the second point as 50° on his scale divided into 80° equal parts and called them degrees. The Centigrade scale was made by Celsius, and is used by scientific men all over the world. The freezing point of water is taken This is the as the zero and the boiling point as 100°. As usual the intervening space was divided equally into 100 degree parts. Fig. 1 shows a comparison of the three scales.



Réaumur Fahrenheit Centigrade FIG. 1

Construction of a mercury-in-glass thermometer. — When mercury is heated it expands. If a method of measuring this expansion is obtained, the temperatures corresponding to any increase of volume can be defined. To construct a thermometer for accurate measurements, a capillary tube of uniform bore is selected. The smaller the bore the more sensitive the thermometer is, but it adds to the difficulty of cleaning, filling, etc. The tube is first thoroughly cleaned and a bulb blown at one end. The size of this bulb is adjusted by the experience of the glass blower. The larger the bulb the more sensitive is the thermometer, but the walls of the bulb must be strong. The next process is to fill the bulb with mercury. The bulb is heated to expel some of the air, and the open end of the tube placed under mercury. As the air in the bulb cools, it contracts, and some mercury is drawn into the tube and bulb. The tube is then gently warmed, bulb downwards, until the mercury boils and its vapour fills the bulb and tube. On again inverting grade scale. Réaumur took the freez-the tube over mercury and allowing to ing point of water as zero and the cool, the bulb should be completely filled with mercury. must be heated again. bore is almost closed. The mercury is warmed until it flows past the narrow part, and the latter rapidly heated to send it off. The thermometer is then put away for a year or so to completely contract and get 'cured.'
The thermometer must then be graduated. It is immersed as completely as possible in a mixture of ice and water. The mixture will be at When the column of mercury has become settled, a mark is placed on the tube opposite to the top of the mercury meniscus. The thermometer is then put aside for a short time, cools again the index and then immersed completely in the at C is left behind steam issuing from boiling water. A Thus this index marks mark as before is placed on the tube.; the

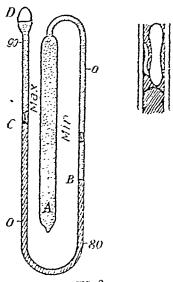


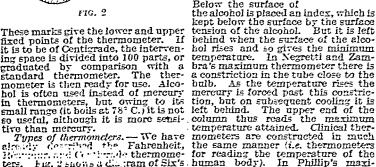
FIG. 2

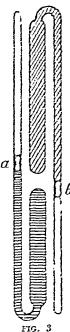
These marks give the lower and upper fixed points of the thermometer. it is to be of Centigrade, the intervening space is divided into 100 parts, or graduated by comparison with a standard thermometer. The thermometer is then ready for use. Alcohol is often used instead of mercury tive than mercury.

Fig. 2 shows a diagram of Six's, human body).

If not, the bulb self-registering thermometer, which is n. The tube is the oldest of its kind. The bulb Λ is then drawn out near the end until the filled with alcohol or some such liquid, and this extends to B. BC is a thread of mercury with surfaces at B and C. Above C more alcohol is placed. The tube CD ends in a bulb D, in which there is a space for the expansion of the alcohol. Two steel springs, indices (see side diagram), are placed one above each end of the thread BC. They are just strong enough not to slip. When the temperature rises, the alcohol expands and pushes forward

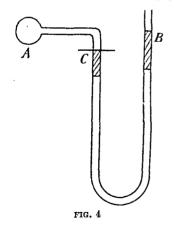
the mercury column EC, and the index at C. When it cools again the index maximum temperature attained. the temperature falls, the alcohol in A contracts and the end B pushing the rises, index with it. it expands again this index is left behind and marks the minimum temperature. Fig. 3 is a diagram of Rutherford's maxi- a mum and minimum thermometer. It consists really of two thermomeseparate The maximum ters. thermometer, on the right, is filled with mercury. As the temperature rises mercury meniscus pushes an index be-This is left fore it. This is left behind to mark the maximum temperature, as the tempera-ture falls again. The minimum thermometer, on the left, is filled with alcohol. Below the surface of





mum thermometer, a short thread of give a temperature between 0° and mercury is separated from the rest by 100° by simply reading the pressure. a small air bubble. This thread is Air expands by τ_{13}^{1} of its volume for a small air bubble. This thread is pushed forward as the temperature cach degree rise in temperature. The stem of a constant-pressure therperature falls, and thus indicates the perature falls, and thus indicates the maximum temperature. This thermometer is used in deep-sea sounding, etc., being very stable. The hypsometer is a combination of thermometer and water-boiling apparatus. is known that the boiling point of water varies at different altitudes. This variation is of use in determining the heights of mountains by finding the boiling point at the top. The hypsometer is the instrument used, and is very strong and portable.

Gas thermometers. - A gas constitutes a much more sensitive thermometric fluid than any liquid, for two reasons: (1) Its specific gravity is low and it can be obtained at a definite standard of purity, and (2) its coefficient of expansion is large. There are two types of gas thermometer (air is usually used)—(1) The constantvolume air thermometer, (2) conthermometer. stant - pressure air Jolly's is the simplest form of constant-volume air thermometer (Fig. 4).



A glass bulb A of dry air is connected to a glass tube B by a flexible Mercury fills the flexible tube and part of B. The level of mercury is kept fixed in one limb, i.e. at C. The volume of air in A is thus constant. The difference of level of mercury at C and at B gives a measure of the pressure. The pressure is determined for the temperatures of melting ice, 0°, and steam rom boiling water, 100°. The instrument can then be graduated to Thermopylæ, often called simply Pylæ, a celebrated pass leading from Thessaly into Locris. The pass of Strument can then be graduated to T. is especially celebrated on account

rsion nown

air should have no volume at -273° This, then, is the zero. This zero is found to agree with that on Kelvin's scale. The constant-pressure ther-mometer is similar to that shown on Fig. 4, except that the stem is graduated and the mercury is brought to the same level in the two arms before a reading is taken. For most accurate scientific work, the platinum resistance thermometer is most serviceable. This instrument was devised by Sir W. Siemens and perfected by Callendar and Griffiths. The latter two found that pure platinum, when free from strain, always had the same specific resistance at the same tem-The resistance of platiperature. num wire is not permanently altered by heating or cooling. Its resistance increases uniformly with increase of temperature. If R is the resistance at temperature and a second constant of the cooling of the c at temperature 8 and R0 that at 0° C., $R=R0(1+a\theta)$, where a is the coefficient of increase of resistance. Thus platinum wire is well suited for a standard. In the platinum thermometer, a coil of wire is wound It is well around a mica framework. protected from chemical action of the atmosphere by means of a hard glass or porcelain tube. The resistance of the wire is ascertained by a Wheat-stone-bridge method (q.v.) for several known temperatures and its resistance calibrated. The thermometer resistance is thus a measure of the The advantage of this temperature. thermometer is that it is permanent, is remarkably free from errors, and can be employed over a very wide range. It is of interest to note that a, the co-efficient of increase of resistance, is 234. Thus the resistance of the platinum would be zero at -273° C. If, then, the resistance of the wife week found. wire were found at 0° and 100° in the wire were found at U and 100° in the usual way, we could obtain a platinum scale by dividing the difference of resistance into 100 parts and let each part correspond to a degree. Such a scale would have the same zero, -273° C., as a gas scale, but the individual readings on both scales do not outle agree. Even a fuller descripnot quite agree. For a fuller description of the evolution and use of the platinum thermometer, the reader is advised to look up the original papers of Callendar and Principal Griffiths. Thermopylic, often called simply Pylm, a celebrated pass leading from Thessaly into Locris. The pass of

against Xerxes.

Theron (d. 472 B.c.), a tyrant of Agrigentum, the son of Ænesidemus. He seized the reins of government about 488, and strengthened his position by marrying his daughter to Gelo. With this ally he won a great victory over the Carthaginians at Himera in 480.

Thesaurus, see Dictionary.

Theseus, the great legendary hero of Attica, was the son of Ægeus, King of Athens, and of Æthra, the daughter of Pittheus, King of Træzen. He was brought up at Træzen, and when he reached maturity he took, by his mother's directions, the sword by his mother's directions, the sword and sandals, the tokens which had been left by Ægeus, and proceeded to Athens. Eager to emulate Hercules, he went by land, displaying his prowess by destroying the robbers and monsters that infested the country. By means of the sword which he carried, Theseus was recognised by Ægeus, acknowledged as his son, and declared his successor, to the exclusion of the sons of Pallas. The clusion of the sons of Pallas. capture of the Marathonian bull, which had long laid waste the surrounding country, was the next exploit of Theseus. After this he went of his own accord as one of the seven youths whom the Athenians were obliged to send every year, with seven maidens, to Crete, in order to be devoured by the Minotaur. When be devoured by the Minotaur. When they arrived at Crete, Ariadne, the daughter of Minos, became enamoured of Theseus, and provided him with a sword with which he slew the Minotaur, and a clue of thread by which he found his way out of the labyrinth. Having effected his object, Theseus sailed away, carrying off Ariadne. He was generally believed to have had by her two sons, Chopion and Staphylus. As the vessel in which Theseus sailed approached Attica, he neglected to hoist the white sail, which was to have been the white sail, which was to have been the signal of the success of the expewhereupon Ægeus threw himself into the sea. Theseus thus became King of Athens. One of the most celebrated of the adventures of Theseus was his expedition against the Amazons. He is said to have assailed them before they had recovered from the attack of Hercules, and to have carried off their queen, Antiope. The Amazons in their turn threads at the first head to the first head. invaded Attica, and the final battle in which Theseus overcame them was fought in the very midst of the city. Theseus was said to have had, by Antiope, a son named Hippolytus, and after her death to have married Phædra. Theseus figures in almost all the great heroic expeditions.

of the heroic defence of Leonidas; He was treacherously slain by Lycomedes.

Thesiger, Frederic, see CHELMSFORD, FREDERIC THESIGER.

Thesmophoria, a festival in honour of Demeter as the founder of agriculture and patroness of marriage, celebrated widely in Greece and especially at Athens. It was held for five days in the month Pyanepsion (early November), only married women of Attic birth and stainless character taking part. On the first day of the feast (Στήνια) there was a procession to the deme or township of Halimus. to the deme or township of Halimus. See Preller, Demeter and Persephone, p. 335 (1887); Mommsen, Heortologie, p. 287; Harrison, Prolegomena to the Study of Greek Religion, 1908; Scholien on Lucian, Dial. Meretr., ii. 1, published by Rohde, 1870; Smith, Dict. of Antiq., 1891. See Mysteries. Thespiæ, an ancient Greek city near the base of Mt. Helicon, in Bæotia. Its history seems guided by an inveterate hatred for the neighbouring and stronger city of Thehes.

bouring and stronger city of Thebes. which dismantled its walls in 423 B.C., captured it in 372 B.C., and finally razed it to the ground. In 480 B.C. T. did not disgrace itself by mediatis-ing to the Persians. This city was the proud possessor of the beautiful Eros of Praxitcles which the sculptor gave to Phryne, his mistress.

Thespis, the father of Greek tragedy, lived during the latter part of the 6th century B.C. His alteration in the old tragedy connected with the Dionysian festivals was the introduction of an actor, for the sake of giving rest to the chorus. This actor took various parts in the same piece under various disguises, which took the form of linen masks. See Haigh's Tragic Drama of the Greeks.

Thesprotia, or Thesprotis, in ancient geography, a district of S.W. Epirus, near the sea. Theopompus century B.C.) makes the Thesproti, one of the principal Epirot tribes, live in the region N. of the Ambracian Gulf. In Thesprotia were the colonies of Elatria, Bacheta, and Pandosia, established from Elis, and the other

important towns were Cassope and Ephyra, afterwards Cichyrus.

Thessalonians, The Epistles to the were probably written by St. Paul from Corinth at the time when he was working there with Silvanus and Timothy (Acts xviii. 5) between 51 and 53 a.d. They are, therefore, among the earliest of St. Paul's epistles, and their genuineness is universally acknowledged. In Acts xvii. we read of St. Paul's visit to Thessalonica, and of the bad reception he received from the Jews. The Greeks and devout women, however, showed much eagerness to learn his message,

and to them he turned. The Epistles, salians were a Thesprotian tribe, and then, which follow each other closely, invaded the W. part of the country, are addressed to a Gentile audience. The immediate occasion of the First they subsequently spread over the Epistle is the favourable intelligence other parts of the country. The brought to the Apostle by Tim of the steadiness with which

which they were assailed by their own countrymen. From it we learn what had been St. Paul's message and appeal when he was himself in Thes-He had appealed to the primary feelings of the human heart and then passed on to speak of Jesus which delivereth us from the wrath to come? (i. 10). This particular insistence on the Judgment and the Second Advent had led to much questioning, and in the latter part of the letter St. Paul deals with these. His letter, however, did not settle all difficulties, though the news which St. Paul later received from Thessalonica was in many aspects encourag-ing. The expectation of the immediate coming of the Lord still caused great excitement and the neglect of the duties of daily life. The Second Epistle is intended to allay this excite-ment. See article in Hastings' Dic-tionary of the Bible and Cuthbert Lattey's translation of the Epistles to the Thessalonians (1913).

Thessalonica, see Salonica.
Thessaly, the largest div. of Greece.
Thessaly Proper is a vast plain shut in on every side by mountain barriers, broken only at the N.E. corner by the valley and defile of Tempe, which separates Ossa from Olympus. This plain is drained by the H. Peneus and its affluents. In addition to the plain already described, there were two other districts included under the general name of Thessaly; one called Magnesia, being a long narrow strip of country extending along the coast or country extending along the coast of the Ægean Sea from Tempe to the Pagasman Gulf, and the other being a long narrow vale at the extreme S. of the country, lying between Mts. Othrys and Œta. Thessaly Proper was divided in very early times into four districts or tetrarchies, a division which were still find enhesting in the four districts or tetrarchies, a division which we still find subsisting in the Peloponnesian War. These districts were: (1) Hestimotis, the N.W. part of Thessaly: (2) Pelasgiotis, the E. part of the Thessalian plain; (3) Thessaliotis, the S.W. part of the Thessalian plain; (4) Phthiotis, the S.E. of Thessaly. Besides these there were four other districts, viz.: (5) Magnesia; (6) Dolopia, a small district bounded on the E. by Phthiotis, on the N. by Thessaliotis, on the W. by Athamania, and on the S. by Œtœa; (7) Œtœa, a district in the upper valley of the Spercheus; and (8) Malis. The Thesseparate cities be-

the power being Thessalonians adhered to the in spite of the persecutions with families descended from the ancient kings. Of these, two of the most powerful were the Aleuadre and the Scopadæ. The Thessalians never became of much importance in Grecian history. In 344 B.C. Phillip completely subjected Thessaly to Macedonia. The victory of T. Flamininus at Cynoscephalm, in 197, again gave the Thessalians a semblance of independence under the protection of the Romans.

Thetford, a market tn., 31 m. W.S.W. of Norwich, at the junction of the Thet with the Little Ouse, in Nor-folk and Suffolk, England. Castle folk and Suffolk, England. Castle Hill is a large carthwork of antiquity.

Pop. (1911) 4778.

Thetis, in ancient Greek mythology, a sea-goddess, daughter of Nereus and Doris, and mother of Achilles. So beautiful was she that gods as well as men sought her in marriage, Jupiter himself being among her suitors, though he withdrew on learning that she should have a son who should become greater than his father. She was married at length to Peleus, During the Trojan War she appealed to Jupiter on behalf of her son Achilles to give success to the Trojan arms, which Jupiter consented to do.

Theuriet, André (1833-1907), a French novelist and poet, born and educated at Marly-le-Roi in the dept. He entered the of Scine-et-Oise. Finance Department in 1857. early works were noems, among which may be mentioned : Le Chemin des Bois; Le Bleu et le Noir; Le Livre de la Payse; and Jardin d'Antonine, He also wrote a one-act verse drame, entitled Jean-Marie. Among his numerous novels may be mentioned: Mademoiselle Guignon, 1874; Le Filleul d'un Marquis, 1878; Flavie, 1895; L'Oncle Scipson, etc. Theyenot, Jean (1633-67), a French

traveler, said to be the nephew of the above. He made extensive travels through Europe (1652-55), and then set out for the East (1655-59, 1663-67), and published an account of his tweeter it there account of his

travels in three volumes.

Thevenot, Melchisedec (1621-92), a French scientist, who suggested the founding of the Academic des Sciences (1666). He published Voyages (1666-72), a collection of travels and discoveries, and Recueil de Voyages appeared in 1683.

Thian-Shan, see Tian-Shan Thibaudin, Jean (1822-1905), French general, born at Moulins-Engilbert, Nièvre. After serving for some time in the Franco-German War he was captured at the battle of Metz, but escaped to France.

Thibaut, Anton Friedrich Justus (1772-1840), a German jurist, born at

Hameln, and after studying at Göt-tingen, Königsberg, and Kiel, was appointed professor of civil law at the last-named university in 1798. In 1802 i , and four years : where he remair He published Theorie der logischen Auslegung des Römischen Rechts (1799), etc.

Thibaut IV. (1201-53), Count of Champagne and King of Navarre. On the death of Louis VIII., a league was formed by a number of the most powerful French nobles to prevent Blanche, the queen, from acting as regent. T. was at the outset a party of this confederacy, but seen a party to this confederacy, but soon abandoned it, which greatly incensed the Duke of Bretagne and his coadjutors, and they soon after formed the project of harassing him by supporting the claims of the Queen of Cyprus upon Champagne and Brie. Louis IX. marched to the assistance of T., and a compromise was arranged. The poems attributed to T. are in number sixty-six.

Thibaw, or Hsipaw, a Shan state of Upper Burma, with an area of 5080 sq. m., traversed by the Namtu. Rice, cotton, and tea are the chief articles of produce. Pop. 105,000.

Thibot, see TIBET

Thielen, Jan Philip van (fl. 17th century), lord of Cowenburg, a painter, was born at Mechlin, and became a pupil of Daniel Segers. His best pictures are of St. Bernard and St. Agatha.

Agatha.
Thielt, a tn. of W. Flanders, Belgium, 15 m. S.E. of Bruges. It is an ancient town, and was largely destroyed by fire in 1383. It has a linenbleaching industry, and manufactures textiles. There is an old cloth-hall and a fine beliry. Pop. 12,006.
Thierry, Jacques Nicolas Augustin (1795-1856), a French historian, born at Blois. On leaving school he became the secretary of Saint-Simon, at

Saint-Simon, the secretary of Saint-Simon, at whose suggestion he published his first work, De la Réorganisation de la Société Européenne. His Histoire de la Sociale Europeenne. His histoire de la Conquête de l'Angleierre par les Normands (1825) cost him his eyesight. His other publications include: Récils des Temps Mérovingiens, 1840, and Recueil des Monuments inédits de

l'Histoire du Tiers Etal, 1850-70.
Thiers, a tn. of dept. Puy-de-Dôme, France, on R. Durolle, 25 m. N.E. of Clermont-Ferrand. There are im-Clermont-Ferrand. There are important manufs. of cutlery and bank-note paper. Pop. 17,400.

Thiers, Louis Adolphe (1797-1877). a French statesman and historian, born at Marseilles of humble parent-In 1821 he entered the offices of the Constitutionnel, his articles in which quickly placed him in a position of independence. Journalism not satisfying his ambition, he collaborated with Felix Bodin in the production of a History of the Revolution (the greater part of which was the work of T.). In 1830, his antipathy to the Bourbons prompting him to seek a more vigorpolemical field than that of oths Potentical field that that the Constitutionnet, he founded the National. After the nomination of Louis Philippe as King of France, T. was rewarded for his publicist services by being nominated a councillor of the state and a post in the Treasury. Later he became Under-Secretary of State to the Treasury (1831), supporting the peace policy of Casimir Perier.
Was Minister of the Interior in Soult's cabinet of 1832 during the Paris insurrection, the sanguinary suppression of which has left an in-effaceable blot upon his name. In 1836 he was placed at the head of the cabinet, and carried out, among other cabinet, and carried out, among other liberal reforms, the suppression of lotteries and gaming houses, and the reduction of tariff duties on inland trade. In 1840 he became President of the Council and Foreign Secretary. He supported Mehemet Ali against Turkey with the object of assuring to the latter the retention of Egypt, and later, after the conclusion of peace between England, Russia, Turkey, Prussia, and Austria, he made all preparations for war as a demonstration against the exclusion of France frequencies for war as a definition against the exclusion of France from the European concert, but his policy only resulted in the prompt recalling of the French fleet from Turkish waters and his own retirement. He then devoted himself to writing historical works, and published his huge work, the History of the Consulate of the Empire. After the proclamation of the republic on the fall of Louis Philippe's government, he made strenuous efforts to overthrow the republic while appearing to support it, but his reactionary efforts only caused him to be hanished from French territory on the subsequent restoration of the empire, whither he did not return till 1852. In 1863 he was nominated deputy for one of the divisions of Paris. the fall of the empire following upon the debacle at Sedan, he was elected President of the Assembly, and shortly after became President of the republic. In 1873, wishing to avoid being made the instrument of monarchist intrigue, he voluntarily resigned. Other works of his are: The Monarchy from 1830; The Law of Property,

1848; Saint Helena, 1862; Communism, | changes. It is always being lost by 1849.

Thigh, the part of the lower limb between the pelvis and the knee. The T. bone, or femur, is the longest bone in the human body, constituting about 275 of the height from sole to It articulates with the os crown. innominatum above, and with the libia below.

Thingvalla-vata, one of the largest lakes of S.W. Iceland, situated about 21 m. E. of Reykjavik. It is 11 m. long, and its greatest width is 6 m.

Arca 30 sq. m.

Thionville, see DIEDENHOFEN. Thiophene (C.H.S), a sulphur compound contained in impure coaltar benzene. It resembles benzene closely in chemical and physical pro-perties, and can only be separated from it by repeated treatment with sulphuric acid. With sulphuric acid and a trace of isatin, T. gives a beautiful blue colouration.

Thirlage, in Scots law, is that servitude by which possessors of lands in some parts of the country are bound to grind their grain at a particular mill-to which mills the lands are said to be 'astricted' or

thirled.

a lake of the Lake Thirlmere, nirmere, a take of the Lake District, Cumberland, England, 3½ m. S.S.E. of Keswick. It is 3 m. in length and about ½ m. in width, with a depth of nearly 100 ft. It is surrounded by lofty heights; on its E. shore rise Helvellyn and Whiteside, whose slopes are well wooded, while on its W. side are Armboth Fells and Raven Crag, whose slopes are bare and cut by mountain torrents. the water supply affords Manchester.

Thirlwall, Connop (1797-1875), an English divine and historian, born in London; was educated at the Charterhouse, London, and Trinity College, Cambridge, and was called to the bar in 1825; but the law not attracting him he took holy orders in 1827, and became tutor and lecturer at Cambridge until 1834, when he was given the living of Kirby Underdale. In 1840 he was appointed by Melbourne to the see of St. David's. He translated works by Ticck, Schleiermacher, and Niebuhr into English, and wrote several books. His masterpiece was his History of Greece (1835-44).

Thirsk, a market tn. of the N. Riding noted, and a trade is carried on in corn, wool, timber, etc. Pop. (1911)

3100.

various organs, the amount lost varying greatly with the conditions of life. This loss directly affects the blood, but this is not lasting, as the blood draws upon the vast resources of the other body tissues for its supply of water, consequently the tissues require a new supply to restore them to their normal state. sense of T. then comes into play; we become thirsty and take into our bodies water in varying quantitles according to our needs. Little is known concerning the nervous mechanism controlling this sensation, but it is assumed that when the water content falls below a certain amount the nerves in the pharyngeal region are stimulated and so give rise Thirty-nine Articles, The, of the

their heading as 'Articles agreed upon by the archbishops and bishops of both provinces and the whole clergy, in the Convocation holden at London in the year 1562, for the avoiding of diversities of opinions, and for the establishing of consent touching true religion.' Their history, however, begins before this date. On the death of Henry VIII., the government of the country was left in the hands of a group of nobles, of whom almost all were in favour of the reformed doctrines, and the changes in the teaching and practice of the Church increased with great rapidity. The ancient landmarks were being re-moved, and it was desirable that fresh ones should be set up. In 1549, Parliament empowered the king to appoint a commission for the drawing up of ecclesiastical laws, and in accordance with this Act a commission was appointed in 1551 consisting of eight bishops, eight divines, eight lawyers, and eight other representa-tives of the laity. This commission, which included Cranmer, Ridley, which included Cranmer, Rudley, Coverdale, and Peter Martyr, began by drawing up a code of forty-two articles which were published by royal authority in 1553. It seems probable that Strype and Burnet are wrong in making it appear that these articles had also behind them the authority of the Convocation of 1552. To these articles was prefixed Cran-mer's Calechism. In the same year Edward VI. died, and the Convocaof Yorkshire, England, II m. N.E. of tion of the first year of Mary denied Ripon. Its fairs and markets are that the articles had received their consent, and entirely repudiated them. The tide of reformation was thus stemmed for a while, but on the accession of Elizabeth it was resumed. Thirst, a desire for drink, made sion of Elizabeth it was resumed. known by sensations projected to the pharynx. The amount of water con-moderation. Parker occupied the tained in the body is subject to great see of Canterbury, and he submitted

derwent considerable further alterations, in course of which they were reduced in number to thirty-nine, and were finally promulgated in 1571. The first half of the twentieth article was omitted in some copies, and there continued to be some discussion as to continued to be some discussion as to which was the authorised form, until in 1604 they were finally settled in the form in which they are now used. The T. A. were adopted by the Convocation of the Irish Church in 1635, and by the Scottish Episcopal Church in 1804. Especially during the last century, controversy has raged as to the nature and meaning of the articles. Some have tried to divinity, but they are plainly devised divinity, but they are plainly devised to meet a special need, and hear the marks of compromise in every line. They are, indeed, chiefly negative, condemning the errors of the mediæval Church and those of certain of the Protestant sects. They are, on the whole, Calvinistic in tone, but their extreme elasticity has been well shown by Newman and Jowett. former of these, in the famous Tract XC., attempted to prove that they were in no way contrary to the Decrees of Trent. Well-known com-Decrees of Trent. nentaries on the articles are those of Beveridge (1716), Forbes of Brechin (1807, 2nd ed. 1872), and Harold Browne (1850, 12th ed., 1882). Thirty Years' War, The. Practically it may be said that the T. Y. W. was

the result of the German Reformation and the Counter-Reformation. The war began in 1618 by the offer of the crown of Bohemia to the Lutheran prince, the elector of the Palatinate, son-in-law of James I. of England and father of the Princes Rupert and Maurice. The troops of the apparent immediately entered of the emperor immediately entered Bohemian territory and drove Frederlek out, depriving him also of his electorate of the Lower Palatinate. Incidentally, the inactivity of James I. of England in the Protestant cause inflamed his subjects and was one of the causes of the great unpopularity of the Stuarts. The territories so of the Stuarts. The territories so annexed by the Emperor Ferdinand were handed over to Maximilian of Cetholic: an Bavaria and so became Catholic; an Illustration merely of the 16th-century principle that the religion of the prince is also the religion of his subjects. lects. The Hapsburgs now developed their policy on larger lines; Germany was to become a Hapsburg

to Convocation a revised form of the Baltic ports seemed to lie at their original forty-two articles. These underwent considerable further alterations forward as the champion of German Protestantism, but was defeated and forced to make peace in 1629 (Lübcek). Wallenstein had es-1629 (Lübeck). Wallenstein had established the Hapsburg supremacy in the north, but had failed to take Strait sund. In the following year we find Gustavus Adolphus coming forward as the champion of Protestantism, and with his appearance we get the beginning of the end. Wallenstein had been dismissed at the Diet of Ratisbon; the German princes feared the man whom they regarded as a mere mercenary upstart. Gustavus Adolphus marched from victory to victory. His army was the precursor of the principle which held the Ironsides and the Covenanters together. Tilly was defeated at Breitenfeld, and Gustavus marched to the S. In 1631 he again defeated, and killed, Tilly at Lech, and then Wallenstein was recalled. Gustavus won the battle of Lützen (1632), but was killed, and much of his work was undone. From this point practically the religious of the war motives disappear. France, anxious to break the power of the Hapsburgs, gave support to the Swedes and German Protestant princes. Richelieu played his hand well; enemies were raised up to the Hapsburgs in Germany, Italy, and Hapsburgs in Germany, Italy, and Spain; the Dutch weregiven support in their struggle against Spanish power; and the power of the Hapsburgs, both Austrian and Spanish, began to decline. The policy of Richelien was continued after his death by Mazarin, and the French generals, Condé and Turenne, won brilliant victories over the transposition. victories over the imperialists. nally the end came in 1648 when the emperor, suffering from defeats in Germany at the hands of the Swedes and the French, agreed to terms of peace. Peace was signed at West-phalia in 1648 (October). The terri-torial gains of France and Sweden were recognised, and the independence of the German princes. The attempted revival of the power of Catholicism by means of the edge of the sword had failed, and the imperial power became nominal elsewhere than in Austria. The independence of Portugal and the United Provinces (Holland) was also recognised by this treaty. Thisbe, see PYRAMUS. Thistle, a name given to various

composite plants of which the best known are those that belong to the possession and the territory lost to genera Carduus and Cnicus. Others Catholicism by the Reformation was to be regained. The imperial generals, Tilly and Wallenstein, swept all garis); the Globe T., which belongs to before them, N. Germany and the the genus Echinops; and the HedgeT. is Silybum marianum, a handsome 7000. plant often grown in gardens. Its

roots and young leaves are edible. Thistle, Order of the, see ORDERS

OF KNIGHTHOOD. Thistleton-Dyer, Sir William Tur-

ner, see DYER. Thistlewood, Arthur (1772-1820), a conspirator, was a reformer who sought to achieve his ends by the use of violence. His project in 1820 to assassinate the cabinet ministers when gathered together at dinner at Lord Harrowby's house in Grosvenor Square failed owing to one of the body giving away the secret. T. and his associates were caught in a loft in Cato Street, London, and the attempt became known as the Cato Street Conspiracy (q.v.). T. was tried high treason, convicted, and hanged.

Thistlewood Conspiracy, see CATO

STREET CONSPIRACY. Thlinkits, or Koluschan, form a After linguistic stock of N. American abori-settled in Paris and began his opera-The name Koluschan is derived from kalosh (Aleut) rived from kalosh (Aleut)
dish, in allusion to their
lip ornaments. They
narrow strip along the h
with adjacent islands, f
60° N. The chief tribes, all speaking l
dialects of the same language, extremely harsh, are the Auk, the
Hanega, the Hoodsunci, the Keh,
Sitka, Taku, Tongas, and Yakutat.
The total number of the I. is about

6000.

Tholen, an island of the Netherlands, in the prov. of Zeeland, situated on the N. of the E. Scheldt.
Tholuck, Friedrich August Gottreu (1799-1877), a German theologian and preacher, born at Breslau, and studied in his native city and at Berlin. Here he came under Neander's influence, and in 1894 exceeded? influence, and in 1824 succeeded De Wette as professor of Oriental languages. In 1826 he went to Halle as professor of theology, and here, except for one short interval, he remained for the rest of his life. His work is marked by pletism, eclecticism, and suggestiveness. His works consist marked by pletism, eclecticism, and beers. In room is and distinguished suggestiveness. His works consist of Mill Springs, and distinguished chiefly of commentaries and sermons, limself at Perryville, Murfreesboro, He was made certain works on church history, Die Wahre Heihe des Zweigler (1823), and Andachtsstunden (Eng. trans. 1875).

Thom, William (1799-1848), a Scot-tish poet, born at Aberdeen; he worked he was made major-general. tash poet, born at Aberdeen; no worked in was made major-general; there for many years as a weaver, while subsequently he became a pedlar and itinerant musician. In least the published Rhymes and Recolourt clerk, but studied chemistry in lections, his principal work.

Thomar, a th. of Portugal, 70 r
N.N.E. of Lisbon. Here are ruins a Templar's castle; also the famous iron, and with his cousin, Gilchrist,

(Echinocactus). The Holy convent of the Order of Christ. Pop.

Thomas, one of the twelve disciples, called also Didymus (John xl. 6), a Greek translation of the Hebrew form of 'Thomas.' All the information about him in Scripture is given in the Fourth (

says that he Parthia, dying

Thomas, Arthur Goring (1850-92), an English musical composer, born at Ratton Park, Sussex, and studied in Paris, and at the Royal Academy, London, under Prout and Sullivan. He wrote Esmeralda, the Sun Il orshippers, the Swan and the Skylark, and a great number of ducts and songs. He committed suicide, and was interred at Finchley cemetery.

Thomas, Charles Louis Ambroise (1811-95), a composer, born at Metz. Studied under Kalkbrenner, Le Sueur,

and of taking '

of his twenty-

de of chamber, vocal, and usic.

Thomas, George (c. 1756-1802), an Irish adventurer who rose to be an independent ruler in India; born in Tipperary and entered the navy, but

WAS

ined. being captured and escorted to the British frontier with the fortune he had amassed. He died on the Journey

to Calcutta.

Thomas, George Henry (1816-70), an American general, born in Southampton co., Virginia, and educated at West Point Military Academy. He served in the Sominole War and the Mexican War, and was instructor at West Point from 1851-54. In 1861 he was appointed colonel, and later brigadier-general, of volunteers. In 1862 he gained the victory

my at Cumber-attle of Chattain 1864 he de-

In 1865

The process was

specially valuable abroad. See Memoirs and Letters by Bwinie.
Thomas, William ('Islwyn') (1832-18), a Weish poet, born at Ynysddu in Ionmouthshire. He entered the Calvinistic Methodist ministry in 1859. and became famous in Mynyddislwyn as a preacher. He is recognised as one of the best Welsh poets, but his work is marred by his facility, and his influence, though it freed Welsh poetry from the bonds of the Cynghanedd, tended to foster loose ghanedd, tended to foster loose writing. Some of his pages, however, reach the heights of poetry. His poems include: Barddoniaeth gan Islwyn; Caniadau Islwyn. A complete collec-tion was edited by Owen Edwards in 1897 under the title Gweithiau Islwyn.

Thomas, Christians of St., the oldest Christian church of India, is Nes-torian in doctrine, and probably owes its origin to the Nestorians of Persia. its origin to the Nestorians of Persia. Tradition, however, ascribes it to St. Thomas. From 1599-1653 they were brought under Roman jurisdiction, but they now claim entire independence. They number somewhat less than half a million, and are found in the states of Malabar and Cochin. The liturgical language is Syriac. See G. M. Rac's Syrian Church in India, 1892.

Thomas à Becket, see BECKET.

Thomas à Becket, see BECKET. Thomas à Kempis, sec Kempis, Тиомав л.

Thomas Aquinas, see Aquinas.

Thomasius, Christian (1655-1728), a German jurist and publicist, born at Leipzig, where he began to lecture on the law in 1684. He removed to Halle (1690), where he founded a university (1694).

Thomas of Celano, composer of the Latin hymn, Dies Ira (q.v.).
Thomas of Woodstock, see GLOU-

CESTER, DUKES AND EARLS OF

Thomassiu, Simon (1652-1732), a French engraver, born at Troyes; he lived for a while at Rome, and died in Paris. Besides doing many engraved portraits from life he reproduced various works of the old masters, and also did a series of prints representing the statues in the gardens at Versailles.

Thomassiu, Simon Henri (1688-1740), a French engraver, son of Simon T. (q.n.); born in Paris, he lived there chiefly till his death. He reproduced pictures by De la Fosse, Rigaud, and the younger De Troy, while his prints also include a fine rendering of Watteau's Harlequin

· and Columbine.

Thomas the Rhymer, see ERCIL-

DOUNE, THOMAS OF.

Kilkenny, with flour mills. Pop.

(1911) 1300 Thomasville, cap. of Thomas co. Georgia, U.S.A., 34 m. N.E. o

Georgia, U.S.A., 34 m. N.E. of Tallahassee. A winter health resort, and has cotton, lumber, and fruit in-dustries. Pop. (1910) 6727. Thompson, Sir Benjamin, Count von Rumford (1753-1814), bornat Woburn, Massachusetts, and became a major in a provincial regiment, but being imprisoned for lukewarmness in the cause of liberty, ultimately came to England. Here he obtained employment in the Colonial Office, and made various scientific experiments, returning to America in 1782 as lieutenantcolonel of George III.'s American dragoons. He served the elector of Bavaria, 1784-95, during which period he carried out various reforms, and was made head of the Bavarian War Department, and count of the Holy Roman empire. He quitted the Bayarian service in 1799, and re-turned to London, founding the Royal Institution.

Thompson, Edward (1738-86), an English sailor and poet, was educated at Harrow. He entered the navy in 1755, and took part in the blockade of Brest and the battle of Quiberon Bay. He was also present at the relief of Gibraltar, and was employed in settling Demerara and Essequibo, He wrote: The Meretriciad. 1755(?), an amusing satire; Trinculo's Trip to the [Stratford] Jubilee, a boisterous ode, 1769; A Sailor's Letters, which depicts the social life of the navy, etc.; The Syrens, a two-act masque, and various sea-songs. He also edited the works of Andrew Marvell.

Thompson, Elizabeth and Alice, see BUTLER, ELIZABETH SOUTHERDEN, LADY; and MEYNELL, ALICE.
Thompson, Francis (1860-1907), an

English author, born in Preston. He was educated at Ushaw College, near Durham, and afterwards studied medicine at Owens College, Man-chester, but failing to take a degree he sought his fortune in London. Here he spent some years in various occupations, until in 1893 he sent a poem to the magazine Merrie England. This was at once recognised by Wilfrid Meynell as a work of merit, and he helped Thompson to publish and he helped Thompson to publish his first volume of Poems, which were praised by Coventry Patmore in the Fortnightly Review. This volume was followed by Sister Songs (1895) and New Poems (1897), both of which gave him a recognised place among poets. He also gained a reputation as a prose writer, and published Health and Holiness, a treatise dealing with the ascetic life and an Essay on Thomastown, a tn. of Kilkenny co., with the ascetic life, and an Essay on Ireland, on R. Nore, 9 m. S.E. of Shelley, amongst other works. Messrs.

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Burns and Oates published The in 1839 was presented with a 'chame Works of Francis Thompson (1913) pion's belt' at Liverpool.

Scawen Blunt (1913) and Everard Meynell (1913).

Thompson, William Hepworth (1810-86), an English Scholar, born at York.

Thompson, Sir Henry, Bart. (1820-1904), an English surgeon, born at Framlingham, Suffolk. He studied at University College, London, and in 1863 became surgeon there, being appointed professor of clinical surgery in 1866, and consulting surgeon in 1874. He was also professor of surgery and pathology in the Royal College of Surgeons. He was an advocate of cremation, and wrote: Pathology and Treatment of Stricture of the Urcthra: The Enlarged Prostate: Tractical Litholomy and Litholrity; Clinical Lectures on Diseases of the Urinary Organs; The Preventive Treatment of Calculus; On Tumours of the Bladder; Food and Feeding; Modern Cremation, its History and Practice. Practice.

Thompson, Sir John Sparrow (1844-94), a Canadian statesman, born at Halifax in Nova Scotia, where in 1877 he entered the House of Assembly. In the following year he was made Attorney - General, and in 1881 Premier, but his administration lasted only a year. He was a judge of Nova Scotia Supreme Court from 1882 till 1885, when he entered the Dominion House of Commons and became Minister of Justice. From 1892 till his death he was Prime Minister of

Canada.

Thompson, Silvanus Phillips, F.R.S. Thompson, Silvanus Phillips, F.H.S. (b. 1851), principal and professor of physics in the City and Guilds Technical College, Finsbury; born in York. He was professor of experimental physics in University College, Fristol (1876-85), when he was appointed to his present post. In 1912 to was vaccident of the Ordical Conhe was president of the Optical Conference. His publications include: Elementary Lessons in Electricity and Magnetism; Light Visible and Inmagnesism; Light Visible and Invisible; Dynamo-electric Machinery;
Design of Dynamos; Electro-magnet
Optical Tables; Life and Work of
Faraday; Life of Lord Kelvin.
Thompson, Sir Thomas Boulden,
Bart. (c. 1766-1828), a British viceadmiral, born at Barham, Kent. He
went to sea in 1778, and served in the
W. Undies and on the caset of S

W. Indies, and on the coast of S. America, and in 1797 was with Nelson at Teneriffe. He took part in the blockade of Brest (1799), and in 1801 lost a leg in the battle of Copenhagen. He was created a baronet in 1806, and raised to the rank of vice-

admiral in 1814.

Thompson, William (1811-80), a pugilist, known as Bendigo, born in Nottingham. He defeated Caunt, Soveral volumes Deaf Burke, and Tom Paddock, and

Hepworth (1810-86), an English scholar, born at York. classicali Having studied at Trinity College, Cambridge he became professor of Greek there in 1853, being appointed master of his college in 1866. He published editions of Plato's Phudrus and Gorgias. He also wrote a dissertation on Plato's Sophist, and edited Lectures on the History of the Ancient Philo-sophy by William Archer Butler. Thoms, William John (1803-85), an

English antiquary, born in West-minster. He was a clerk in the secretary's office at Chelsea Hospital for twenty years, after which he be-came clerk to the House of Lords and its deputy-librarian (1863-82). nublished Early Prose Romances, 1828; Lays and Legends, 1834; The Book of the Court, 1838; Gammer Gurton's Famous Histories, 1846; Gammer Gurton's Pleasant Stories, 1846; He also founded Notes and 1846. Queries, 1849.

Thomsen, Hans Peter Jorgen Julius (1826-1909), a Danish chemist, passed his life in his native city of Copenhagen, teaching chemistry at the Polytechnic (1847-56) and Military High School (1856-66) before he was appointed to the chair of his science in the University (1866-91). Thermochemistry (1908) is an abstract of his Thermochemische Untersuchungen (1882-86), in which he gave the results of years of practical research.

Thomson, Allen (1809-84), a Scottish biologist, was professor of physiology at his own University of Edinburgh from 1842-18, resigning that appointment for the chair of anatomy at Glasgow, which he held till 1877. He did much to advance the then

routhful science of embryology.

Thomson, Sir Charles Wyville, F.R.S. (1830-82), a Scottish anturalist, occupied several professorial chairs, the last being that of natural history at his own University of Edinburgh (from 1870 onward). In 1868 and 1869 he went on deep-sea dredging expeditions, and from 1872-76 was expeditions, and from 1872-76 was superintending the scientific staff on

superintending the scientific staff on the Challenger during the deep-sea explorations. T. threw much light on animal life at various depths.

Thomson, George (1757-1851), a musician, born at Limekilns. Fife-shire, and lived chiefly in Edinburgh till his death, being employed as a clerk by the Board for Encourancement of Scottish Manufactures. He was a friend of Burns, and was director of the first musical festival held in Edinburgh, while he compiled held in Edinburgh, while he compiled several volumes of Scottish tra-

Thomson, James (1700 - 48), a Scottish poet, born at Ednam in Roxburghshire, was educated at Edinburgh University, where he occupied his lelsure in writing great quantities of verse, three of which poems appeared in the Edinburgh Miscellany of 1820. of 1820. e intention of but he abandor , and in 1725 went to London to pursue a literary career. He became tutor to Thomas Ramilton (afterwardsseventh Earl of Haddington), and made the acquaintance of many of the leading men of letters. He published in 1726 Winter, which was highly applauded, and this he followed in the next year with Summer. Spring appeared in 1728, and two years later he republished these three poems, adding to them Aulumn, under the title of The Seasons. He subsequently carefully revised this work, but it was not brought out in its amended form until 1744. T. in 1730 had his play Sophonisba produced at Drury Lane, but in spite of its many merits it was not successful. Liberty (1734) and Agamemnon (1738) were his next works, and in 1740 he wrote The Masque of Alfred, which is famous because therein first appeared Rule Britannia. Since 1738 T. had been in receipt of a pension from Frederick Prince of Wales, and in 1744 was given by Lyttelton the sinecure office of surveyor-general of the Leeward Is. His later works include the play Tancred and Sigismunda (1745), in which Garrick played Tancred, and The Castle of Indolence (1748). He was buried in Richmond Church. When T. began to write, English poetry was dominated by artificiality, and Pope was the principal living poet; but T. introduced the true simple remantic treatment of nature, and his influence on his contemporaries as on his successors was unbounded. T.'s Works were first collected in 1763, and have since been There are frequently reprinted.

Thomson, James (1822-92), a Brit-Ish physicist, was also an engineer, inventor, and geologist. He was professor of civil engineering at Belfast (1867-73) and Glasgow (1873-89), and the first to demonstrate the noselbility of lowering the freezing-point of water, etc., by pressure. Thomson, James (1834-82), a Scottish poet, was in early life an

a | National Reformer during the spring of 1874, and was published in book form six years later. There is a Biography by H. S. Salt.

John (1778-1840). Thomson, John (1778-1840), a minister of the Church of Scotland and landscape painter, born at Dailly. Ayrshire; he was appointed to the Parish Church there in 1799, while from 1805 till the time of his death he was minister at Duddingston. Midlothian.

Joseph (1858 ~ 95). Thomson. Scottish explorer in Africa; was left in 1879, after Keith Johnston's death. in sole charge of an expedition to E. Central Africa. In his book entitled To the Central African Lakes and Back (1881) he described the new track he found between lakes Nyasa and Tanganyika and his discovery of Lake Rukwa. His Through Masai-land (1885) is a record of a caravan journey through that country—the first over undertaken. In 1890-91 he traversed nearly 1000 m. of the then unknown country, now called N.E. Rhodesia.

Thomson, William M'Clure (1806-94), an American missionary, sacrificed with brief intervals the years 1833-76 to the work of spreading Christianity in Syria and Palestine. He wrote The Land and the Book

(3 vols.), 1880-83.

Thomson, William (1819-90), an Archbishop of York, became tutor (1847) and afterwards provost (1855) of Queen's College, Oxford. In 1862 he received his high preferment. Though he was sometimes at variance with the High Church party, he im-pressed the church-going public with his broad-mindedness and good sense.

Thomson, William, see KELVIN. LORD.

Thonon-les-Bains, a vil. and holiday resort on the S. side of Lake Geneva, in the dept. of Haute-Savoie, France. Pop. 7000.

Thor, god of thunder, see MYTHO-

LOGY. Thoracic Duct, a duct which conveys the greater part of the lymph and chyle into the blood. It is the common lymph trunk of the body except for the right upper extremity, right side of the head, neck, and thorax, right lung, right side of the heart, and convex side of the liver. It does not, as its name would seem to imply, lie wholly within the thoracic cavity, but begins in the abdomen, on the front of the body of the second lumbar vertebra, by a dilatation known as the receptaculum army schoolmaster, but was dis-nissed for a breach of discipline in 1862. His best work, contributed as by B. V. (Bysshe Vanolis), The Cily root of the neck, and then takes a of Dreadful Night, appeared in the curved course outwards and down-

wards, empties itself into the left! subclavian vein at its junction with the left internal jugular vein. fluct measures, in the adult, between 15 and 20 in. in length.

Thorald, a vil. 251 m. N.W. of Buffalo, in Welland co., Ontario, Canada. Pop. 2500.

Thorax, in anatomy, the upper portion of the trunk, being contained between the diuphragm below, the ribs and sternum in front, the ribs and part of the vertebral column behind, and the base of the neck above. See CHEST.

Thorbecke, Jan Rudolf (1798-1872), a Dutch statesman; went to Leyden University in 1817, and was called to the bar in 1820. After the publica-

arty. He was a real political force, besides being an accomplished orator and author, and helped largely to shape the constitution finally adopted in

1887.

Thoreau, Henry David (1817-62), an American naturalist and author; passed through school and Hurvard University without making any im-pression. The two famous years of his life are those he spent as a recluse in his self-made shanty in the woods near Walden Pond (1845-47), and it is his Walden (1854) which reveals to the world the curious and arresting originality of the man. Here he lived happily on a bare pittance, in-dulging to the full his sympathies with bird and beast, and giving free rein to his fresh and noble but rather egoistic thoughts. Other facts of interest in his life are his intimacy with Emerson, the diversity of his callings, and his contempt for work and wealth.

Thoren, or Thorild, Thomas (1759-1808), a Swedish man of letters; was firstly and lastly an eccentric. In his views on hero-worship and his vene-ration for Cromwell he resembled Carlyle. His admiration for the English, among whom he lived in 1788, was soon changed to contempt and dislike, and his feelings underwent the same change with regard to the French Revolution. In 1793 he was sentenced to four years' banishment for a revolutionary opinion expressed in his Essay on the Freedom of the Public Mind. Some of his poems were penned in English.

Thoresby, Raiph (1658-1725), an English antiquary, born at Leeds. He made an excellent collection of coins, manuscripts, curiosities, etc., one of the finest relyate collections. one of the finest private collections ever made, and was an early fellow of in parliament.

the Royal Society. He wrote Ducatus
Leodiensis, or the Topography of the Poulton station, on the Wyre, in

Town and Parish of Leeds (1715) and Vicaria Leodensis (1724).
Thorn, a tn. on the Vistula, 26 m.
E.S.E. of Bromberg, in W. Prussla, Germany, Since 1878 it has been converted by the Market of the Converted by th verted into a first-class fortress, as it commands a viaduct over the river. In 1853 a monument was erected to Copernicus, who was a native of the town. Timber, cereals, and iron are the chief articles of commerce. Pop. 46,230.

Thornaby-on-Tees (known as South Stockton prior to 1892), a tn. opposite Stockton, and 3 m. S.W. of Middles-brough, in the N. Riding of York-shire, England. The iron industry is of first importance. Pop. (1911)

18,605,

ecognised

Thorn Apple, see DATURA.

Thornback, Thomback, or raja clarata, a species of skate (q.v.), found off the coast of Britain, and is so named from its spiny upper surface.

Thornbury, George Walter (1828-76), an English man of letters, wrote a Life of Turner (1861), the impetuous Songs of the Cavaliers and Roundheads (1857), and over twenty novels.

Thorne, a tn. on the Don, with barge-building and rope-making in-dustries, 10 m. N.E. of Doncaster, in the W. Riding of Yorkshire, England.

Pop. (1911) 5290.

Thorne, Sir Richard Thorne- (1841-99), an English physician, definitely established the fact that water may convey typhoid infection. He urged strongly the crection of isolation hospitals, and in general promoted the science of hygiene and public health. In 1892 he was appointed chief medical officer to the Local Government Board.

Thornhill: 1. A tn. with woollen and shoddy mills, 11 m. S. of Dewsbury, in the W. Riding of Yorkshire, England. Pop. (1911) 11,305. 2. A picturesque vil, with ruins in the neighbourhood, 11 m. S.S.E. of Santaland, 12 m. S. of Santaland.

neighbourhood, 11 m. S.S.E. of San-quhar, in Dumfrieshire, Scotland. Pop. (1911) 1101.

Thornhill, Sir James (1676-1734), born at Weymouth. He received the commission from Queen Anne to paint the interior of the cupola of St. Paul's Cathedral, and afterwards to paint the princess's apartment at Hampton Court. Sir James executed many other large works, as the stair-case, the gallery, and several redinare case, the gallery, and several coilings in the palace at Kensington, a hall at Blenheim, and (with some assistance) the great hall at Greenwich Hospital. Sir James painted also several por-traits and some altar-pieces. Sir James was a fellow of the Royal Society, and represented Weymouth

Lancashire, England. Pop. (1911) 4669. 2. Or Thornton Hall, a station on the Caledonian Railway, 6 m. S. of Glasgow, in Lanarkshire, Scotland.

Pop. (1911) 1100.

Thornton, Bonnell (1724-68), English man of letters, translated some plays of Plantus, contributed essays to the Connoisseur (1754-56). wrote an Ode to St. Cecilia's Day, which was performed at Ranelagh with Dr. Burney's music, and burlesqued the Royal Academy by opening a rival exhibition of London street

signs. Thornton, Sir Edward (1817-1906), an English diplomatist, graduated from Pembroke College, Cambridge, in 1840. After some years spent in the legation at Mexico and in various S. American embassies, he was in 1867 nominated as ambassador at Washington. Here he stayed till his appointment as British minister at St. Petersburg (1881). He assisted in negotiating the treaty of Washington (1871) and the convention with Russia as to the frontier lines of Afghanistan (1885).

Thorough Bass, a term used for the science of harmonic composition. It is sometimes called figured bass, a bass voice part written with numerals below it to indicate the chords of the

harmony.

Thorpe, Benjamin (1782-1870), an English Anglo-Saxon scholar, studied for four years under the Danish philo-logist, Rask, at Copenhagen Univer-sity. His Northern Mythology (3 vols., 1851) makes an appeal to the greatest number of readers, but students derive much benefit from his Analecta Anglo-Saxonica (1834), and from his translations of Cedmon (1832) and the elder 'Edda '(1866).

Thorwaldsen, Bertel (1770-1844), a Danish sculptor. The son of a wood-carver, he was born at Copenhagen and studied for a while in the school of art there; subsequently he went to Italy, where he was influenced by Canova. Soon after his death a permanent exhibition of his work was formed at Copenhagen, while his statue of Byron is now at Trinity College, Cambridge. See Eugène Plon, Thorwaldsen: Sa Vic et ses Œuvres (Paris), 1880.

Thoth. an Egyptian deity, sembling the Greek god Herines, and later identified with Hermes Trismegistus. He was the god of magic, science, and invention, and taught the people how to write and calculate.

Thothmes, or Tethmosis, the name of four kings of ancient Egypt, who belong to the 18th dynasty: Thothmes I. (c. 1540 B.c.) finally subdued and enlarged Cush and made successful name of the vast space of country campaigns as far as the Euphrates. bounded on the N. by the Danube,

Pop. (1911) He was the first king to be interred tall, a station in the Valley of the Tombs of the Kings of Thebes. Thothmes II., his son, reigned less than three years. Thothmes III., the son of Thothmes II., did little till the death of his stepmother and aunt, the despotic Queen Hatshepsut. Besides fighting seventeen successful campaigns in Syria and twice capturing Kadesh, he proved a great builder and administrator. Thothmes IV. was a grandson of Thothmes III., and ruled till about 1400 B.C. He cleared the Great

Sphinx.

Thou (or Thuanus), Jacques Auguste de (1553-1617), a French historian, born at Paris. He became a canon of the Notre Dame in Paris, but he gave up an uncongenial pro-fession, and by 1588 was president of the parlement of Paris, and in great favour with Henry III. He wrote a Historia sui temporis in 138 books (1604-20), which is an invaluable historical document. See Lives by Dupuy (1669) and J. A. M. Collinson

(1807).

Thouars, a tn. in the dept. of Deux-Sevres, France, on R. Thouet, 38 m. S.E. of Angers. Part of the mediæval walls are standing, and there are old churches and a castle. A local trade

centre. Pop. 6250.

Thouars, Louis M. Aubert du Petit-(1756-1831), a French botanist and traveller, born at Bournois, near Saumur. From 1792-1802 he visited Mauritius, Madagascar, and Réunion in company with his brother, Aristide Aubert, a naval commander. He was made director of the Royal Institute of Arboriculture in Paris.

Thought Reading, sec PSYCHICAL

RESEARCH.

Thoumeysser, Johann Jacob (1636-1718), an engraver, born at Basle. He worked subsequently at Strasburg and Lyons, but returned to Basle ere his death. He reproduced the works of several minor portraitpainters, and did some fine plates for the Deutsche Academie der edlen Bau-Bild-und Malerei Künste (Nüremberg). 1675.

Thourout, a tn. of Belgium, in the prov. of W. Flanders, 12 m. S.E. of Ostend. It has manufs. of woollens, linen, and hats. Pop. 10,800.
Thousand and One Night

One Nights,

ARABIAN NIGHTS.

Thousand Islands, the name given to a lake-like expansion of the St. Lawrence R., stretching from King-ston to Brockville, so called from the hundreds of islands which add peculiar charm to the scenery as seen from the shore.

Strymon, and the easternmost of the Illyrian tribes. It was divided into two parts by Mt. Hæmus (the Balkan) running from W. to E., and separating the plain of the lower Danube from the rivers which fall into the Ægean. At a later time the name Thrace was applied to a more limited extent of country. Thrace, in its widest extent, was peopled in the times of Herodotus and Thucydides by a vast number of different tribes. The earliest Greek poets, Orpheus, Linus, Musæus, and others, are all represented as coming from Thrace. The Thrucian Chersonesus was probably colonised by the Greeks at an early period, but it did not contain any important Greek settlement till the migration of the first Miltiades to the country, during the reign of Pisi-stratus. The first really historical fact respecting them is their subjugation by Megabazus, the general of Darius. After the Persians had been driven out. of Europe by the Greeks, the Thracians recovered their independence: at the beginning of the Peloponnesian War, almost all the Thracian tribes were united under the dominion of Sitalces, king of the Odryse, whose kingdom extended from Abdera to the Euxine and the mouth of the Danube. Sitalces fell in battle against the Triballi in 424, and was succeeded by his nephew Seuthes, who raised his kingdom to a height of power and prosperity which it had never previously attained. Philip, the father of Alexander the Great, reduced the greater part of Thrace; and after the death of Alexander the country fell to the share of Lysimachus. It subsequently formed a part of the Macedonian dominions.

Thrale, Mrs., see Piozzi. Thrapston, a tn. of Northamptonshire, England, on R. Nene, 18 m. N.E. of Northampton. Iron ore is mined in the vicinity and the town has blast furnaces. It is a market has blast furnaces.

nas biast ittriaces. It is a market town. Pop. (1911) 1800. Thrasea, P. Pretus (d. 66 A.b.), a Roman senator, and Stoic philoso-pher, in the reign of Nero, a native of Detarium. He made the vocuser He made the younger Patavium. Cato his model, of whose life he wrote After incurring the an account. hatred of Nero, he was condemned to death by command of the emperor.

Thrashing, the separation of the grain from the straw, or the seed from the haulm. Formerly, the operation was performed by the flail, and the use of this laborious but effective implement appears to be reviving on small-holdings. The first workable T. machine was invented by Andrew

on the S. by the Propontis and the Ægean, on the E. by the Pontus Euxinus, and on the W. by the R. Strymon, and the easternmost of the livers the straw unbroken and ready Illyrian tribes. It was divided into two parts by Mt. Hæmus (the Balkan) ally employed, but water-power and layer horsewards are horsewards. horse-gears are occasionally employed, more especially with fixed machines. The grain is passed by hand or self-feeder into the drum mouth and is threshed out by beaters. The straw is passed out after the grain has been shaken away, by means of riddles and air-blast from a fan and rotary screens which grade the corn. Among the modern improvements and accessories are chaff bagging apparatus, automatic elevator for delivering chaff direct into a building, and trussing machines for tying the straw into bundles as fast as it is delivered.

Thrasimene, see TRASIMINE. Thrasybulus, a celebrated Athenian, son of Lycus. On the establishment of the Thirty Tyrants at Athens he was banished, but, by the assistance of the Thebans, succeeded in overthrowing the Ten, who had succeeded to the government, and eventually obtained possession of Athens, and restored the democracy, 403. In 390 he commanded the Athenian fleet in the Ægean, and was slain by the inhabitants of Aspendus.

Thrasymachus, a sophist of Chalcedon who flourished in the 5th century B.C. He is introduced by Plato into his Republic.

Thread, a fine cord made by twisting the fibres of such substances as cotton, wool, silk, and flax. The slightly twisted yarns used for weaving are strictly called threads, but the term is more commonly applied to the stronger and more highly finished cords used for sewing, etc. cotton or other material is first twisted into yarn, which is doubled upon itself and twisted in the opposite direction to the original twist. The product is then two-ply thread. To make a stronger thread, c.g., six-cord thread, a number of two-ply rarns are twisted by the winding machine again in the opposite direction to the previous twist.

Thread Cells, sec STINGING CELLS. Thread needle Street is a busy thoroughfare, running from Bishopsgate Street to the Bank of England in the City of London. It received its name from the Merchant Taylors' Company.

Thread-worms, see NEMATODES. Threats. It is a felony either (a) verb. ally to accuse or threaten to accuse another of any infamous crime (e.g. murder, rape), with a view to ex-tort from the person so accused or threatened or from any other person

storms.

conviction may involve a sentence of penal servitude for life. The guilt or innocence of the recipient is only material in considering whether the intention of the prisoner was to extort money by his T., or merely to compound a felony (see under Compounding). Similarly it is a felony punishable with penal servitude for any term up to life to send a letter demanding with T. and reasonable cause any money o property. Sending a letter con

Three Kings, Feast of, see TWELFTH

Day.

Three Rivers, or Trois Rivières: The cap. of St. Maurice co., in Quebec, Canada, and lies at the confluence of the St. Lawrence and St. Maurice, 94 m. N.E. of Montreal. Lumber, cereals, and cattle, are shipped from its harbour, and furniture and boots and shoes are manu-Roman Catholic bishop. Pop. 13,691.
2. A tn. with mineral springs and light car factories, on the St. Joseph R., 128 m. by rail E. of Chicago, in Michigań, U.S.A. Pop. (1910) 5072.

Thresher, see FON-SHARK.

Threshing, sec THRASHING. Thrift, the name given generally

to the species of Plumbaginacem in the genus Armeria. Two of these, A. vulgaris and A. marilima, are also known as sea-pinks, as are flowers of Statice armeria, an allied species.

Thring, Edward (1821-87), an English educationist, was headmaster of Uppingham school from 1853 till his death. A most carnest, enlightened, and successful teacher, he built up an enduring reputation for his school. His Theory and Practice of Teaching

appeared in 1883.

Thrips, the name given to members of the family Thripidee in the order They are charac-Thysanoptera. terised by their very narrow wings, suctorial mouth organs, feelers with eight segments, and a downward curved ovipositor in the female.

There is no metamorphosis in these insects, and their diet is vegetarian.

Throat, the front of the neck; or the upper part of the respiratory passages in the neck. See PHARYNX,

any property, money, or valuable security; or (b) to send a letter containing T. to accuse another person of crime with intent to extort something of value; and so gravely does the law regard this offence that a to France he was again imprisoned, conviction may imprisoned. for siding with the Huguenots. went on many missions (1561-67) to Scotland for Elizabeth, but was sent to the Tower (1569) for plotting with Norfolk on behalf of Mary Queen of Scots.

Throndhjem, see TRONDHJEM.

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Three-Colour Process, see PRINTING.

Three Kings, Feast of, see TWELFTH

Day.

DAY.

Three Rivers, or Trois Rivières:

1. The cap. of St. Maurice co., in Quebec, Canada, and lies at the confluence of the St. Lawrence and St. Maurice, 94 m. N.E. of Montreal. Lumber, cereals, and cattle, are shipped from its harbour, and furniture and boots and shoes are manufacture and boots and shoes are manufacture and boots and shoes are manufacture. ture and boots and shoes are manu-Roman Catholic bishop. Pop. 13,691.

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There is no metamorphosis in these insects, and their diet is vegetarian.

Throat, the front of the neck; or the upper part of the respiratory passages in the neck. See Pharmax. LARYNX, QUINEY, SORE THROAT, etc. Throckmorton (or Throgmorton).

any property, money, or valuable Sir Nicholas (1515-71), an English security; or (b) to send a letter conpolitician and diplomatist, fought at taining T. to accuse another person the battle of Pinkie (1547), and was of crime with intent to extort sometimprisoned for complicity in Wyatt's imprisoned for complicity in Wyatt's rebellion (1554). While on a mission to France he was again imprisoned. for siding with the Huguenots. went on many missions (1561-67) to Scotland for Elizabeth, but was sent to the Tower (1569) for plotting with Norfolk on behalf of Mary Queen of Scots.

Throndhjem, see TRONDHJEM.

Thrush, a species of inflammation of the mouth due to a particular fungus known as Oidium albicans or Saccharomyces albicans, and characterised by diffuse white patches. generally occurs in feeble children, but adults, prostrated by wasting diseases, may also be affected by it.

Thrushes (Turdidæ), a family of passerine birds of very extensive distribution and of omnivorous diet. The typical genus Turdus includes several British species, such as the blackbird, the ring ousel, redwing, and fieldfare, to which the name T. is not commonly applied. The song T. not commonly applied. The sons 1. (q.v.), throstle, or mavis, is one of the best known British song-birds. The missel T. or holm T. (T. riscirorus) is a larger bird with a slightly forked tail. It sings before and during

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he was assassinated at Athens soon by the ancients to the most northerly he died at Thasos, and his bones were carried to Athens. At all events, his death cannot be placed later than 401. The Peloponnesian War forms the subject of the history of T. Though he was engaged in collecting materials dur-ing the whole of the war, he does not appear to have reduced them into the form of a history until after his return from exile, since he alludes in many parts of it to the conclusion of the war (i. 13; v. 26). He did not, however, live to complete it: the eighth book ends abruptly in the middle of the year 411 B.C., seven years before the termination of the war. The object of the history of T. war. The object of the history of 1. was to give such a faithful repreas a guide for the future (i. 22). His observation of human character was profound, and his pains-taking accuracy and careful attention to chronology are remarkable. His strict impartiality is another feature of his work. His style is marked by great strength and energy, but he is often obscure, particularly in the speeches, which Cicero found as difficult as we do. See Bury's Ancient Greek Historians, and Jebb's essay on the speeches of T. in Hellenica. The best English edition is that of Jowett (1881).

Thucydides, an Athenian statesman who led the aristocratic party in opposition to Pericles. He was

ostracised in 444 B.C.
Thugs, roving bands of fanatical murderers and robbers who, prior to their suppression in 1830 by Lord William Bentinck, used to infest yarious parts of Central and Northern India. Thuggery, as their system was called, had a religious basis, the murdered persons and a certain part of their belongings being regarded by the T. as sacrifices to the goddess Kali.

Thuin, a com. of Belgium, in the prov. of Hainault, on the Sambre, 8 m. S.W. of Charleroi. There are blast furnaces and stone quarries.

Pop. 6300.

Thuja, see ARBOR VITAE. Thulden, Theodor van (1607-76) a Flemish painter and etcher, born at Bois-le-Duc. He assisted Rubens in executing the Gallery of the Luxem-bourg in Paris. His larger works, such as 'The Martyrdom of St. Andrew' and 'St. Sebastian,' are in the style of Rubens, but his smaller pieces, on markets and fairs, are in the manner of Teniers. He was a fine etcher, and made copies of the works of Abati

and Rubens.

after his return; according to others part of Europe known to them. According to Pliny, it was an island in the northern ocean, discovered by the navigator Pytheas, who reached it after six days' sail from the Oreades. The name T. appears to be merely a classic form of the Gothic Ticl or Tiule, remotest land.

Thumbscrew, an instrument torture which was largely used by the Inquisition in Spain. It is constructed

so as to co

causing the Thun: 1. A lake of canton Bern, Switzerland, traversed by R. Aar, me. Length, m., greatest 1840 ft. 2.

A tn. of canton Bern, Switzerland, on R. Aar, I m. below its exit from above lake, 15 m. S.E. of Bern. A trade centré, and has slate and brick works. Pop. 7415.

Thunder, see LIGHTNING.

Thunderstorms, a series of electrical ween dis-

and thunder. Thunder is produced by the sudden expansion of the air along the track of the lightning. The instant the heating action of the electric spark ceases, the expanded air con-tracts violently, giving rise to a sud-den clap or explosion. The rolling of thunder is due in great measure to repeated echoes. Heat T. are associated with sudden alterations of temperature, and predominate in summer and in hot climates. They most commonly occur in the early afternoon. Cyclonic T. are a common feature of our winter gales and are more dangerous than the summer storms. These winter storms occur at all hours and show no marked diurnal period. With regard to geographical distribution, T. are more abundant in hot than in temperate climates. See Scott's Elem. Meleorology, 1907; and Abereromby's Weather, 1888.

Thuret, Gustave Adolphe (1817-75), a French botanist, born in Paris. He published researches on the fecundation of the Fucaceo in 1853 and 1855, and in 1867 solved with Bornet the question of sexual reproduction in Floridece. He established a botanic garden at Antibes on the Mediterranean. The Etudes Phytologique, 1878, and the Notes Algologiques, 1876-

80, are his chief works.

Thurgau, or Thurgovia, a canton of N.E. Switzerland, having Lake Constance and the Rhine to the N. and N.E. Area 381 sq. m. It is watered by the Thur, Sitter, and Murg. The surface is undulating and fertile. Emd Rubens.
Thule, the name generally given the chief industries. Pop. 134,055. Thurifer (Lat. thus, incense, fero and I bear), that attendant or acolyte | Swewho bears the incense at solemn | release

sorvices.

Thurii, more rarely Thurium (Terra Nuova), a Greek city in Lucania, founded 443 B C., near the site of the ancient Sybaris. It was built by the remains of the population of Sybaris assisted by colonists from all parts of Greece. Among these colonists were the historian Herodotus and the orator Lysias. The new city rapidly attained great power and prosperity, and became one of the most important Greek towns in the S. of Italy.

Thuringia, a name applied to a region of Central Germany, including the minor states of Saxe-Weimar, Saxe-Coburg-Gotha, Saxe-Meiningen, Saxe-Altenburg, Schwarzburg-Rudolstadt, Schwarzburg-Sonderhausen, and two Reuss principalities. The Thuringian Forest is a mountain range of Central Germany, extending N.W. from the Frankenwald for 50 m. to the Werra, culminating in the Beerberg (3225 ft.), and the Schneckopf (3205 ft.)

Thurles, a par, and market tn. of Tipperary, Ireland, on the Suir, 34 m. E. of Limerick. There are turf bogs and coal mines near by. Pop. (1911) 4549.

Thurloe, John (1616-68), an English politician, was appointed secretary to the Council of State in 1652. He sat in Parliament (1654-56), and in Cromwell's second council (1657), and was appointed governor of the Charterhouse (1657), and chancellor of Glasgow University (1658). He strongly opposed the Restoration, and was tried on a charge of high treason, but acquitted.

Thurlow, Edward, first Baron (1732-1805), Lord Chancellor, distinguished himself at an early age at the bar, and took silk in 1762. Three years later he entered Parliament, and in 1770 was Soliettor-General, and a year later Attorney-General. In 1778 he became Lord Chancellor, and was raised to

the peerage.
Thurman, Allen Granbery (1813-95), an American jurist and politician, born in Virginia. He was called to the bar in 1837 at Ohio, and by 1854 had risen to be chief justice. In 1869 he was elected to the United States Senate where he became the recognised Democratic leader, and was mainly responsible for the Thurman Bill, which became law in 1878.

Thurn and Taxis, Princes of, a succession of princes who ruled over an immonse stretch of ground in Central Europe. The most famous of them, Count Matthias, commanded the Bohemian forces at the time of the dispute over the Bohemian succession

and later served Denmark and Sweden, being finally imprisoned and released by Wallenstein. The Princes of Thurn and Taxis claimed an hereditary right over the administration of postal affairs in Central Europe, they having established posts as early as 1460. The last vestige of these rights disappeared in 1868 with their purchase by the N. German Federation. Thurn, Heinrich Matthias, Count von

Thurn, Heinrich Matthias, Count von (1580-1640), was the leader of the Bohemian Protestant insurrection at the beginning of the Thirty Years' War (1618). He invaded Austria in 1619, but was forced to flee after the battle of the White Hill at Prague. He afterwards served in the Swedish army and took part in the battles of Breitenfeld (1631) and Lützen (1632). He surrendered to Wallenstein in 1633.

Thurot, François (1726 - 60), a French sailor, born at Nuits, and served first as a private ersman. He was in command of a squadron in the Seven Years' War, and did much damage along the E. coast of England and Scotland, but in 1760 he was defeated and killed by Hawke.

Thursday Island, lies off the N. point of York Peninsula, Queensland, just E. of Cape York It is one of the smallest of the Prince of Wales Is., and the chief occupation of its inhabitants (1600) is pear fishing.

Thurso, a scaport of Caithness, Scotland, on Thurso Bay at the mouth of Thurso Water, 21 m. N.W. of Wick. It has a harbour safe for small vessels, but obstructed by a bar. It was formerly a trading centre with Scandinavia, and now exports Caithness flagstones. Pop. (1911) 3335.

Thurstan (d. 1140), Archbishop of York, born at Bayeux, elected Archbishop of York (1114), but refused to acknowledge the supremacy of the Archbishop of Canterbury or to accept consecration from him, and was finally consecrated by Pope Calixtus II. at Rhoims (1119).

Thurston, Sir John Bates (1836-97), a British colonial governor, born in London. He went on a botanising expedition in 1864, and was wrecked on Samoa. Here he remained until 1886, when he went to Fiji, and was made consul in 1869. He brought about the transfer of the islands to Great Britain in 1874, and in 1880 was appointed governor of Fiji, to become governor and high commissioner of the Western Pacific in 1887.

Thuya, or Thuja, a genus of evergreen trees or shrubs (order Conlferæ), with small scale-like leaves and monœcious flowers, the female catkins being followed by small cones. Many species are grown in gardens, especially T. occidentalis, arbor rilar or white cedar, and its numerous varieties. The timber of T. giganta

is much valued in N. America.
Thwaites, George Henry Kendrick (1811-82), an English botanist and entomologist, born at Bristol. He made a special study of cryptogams, but in 1849, when made superintendent of the botanical gardens, Peradeniya, Ceylon, he did valuable work on flowering plants. He published Enumeratio Plantarum Zeylaniæ,

1859-64

Thyatira, see AKHISSAR.
Thyme, or Thymus, a genus of aromatic plants small prostrate rose coloured, flowers.

and the mountain T. (T. serpyllum), of which the lemon-scented T. of gardens is a variety. The T. which is chiefly used for seasoning and flavouring is *T. vulgaris*, a native of Southern Europe.

Thymelaceæ, a small natural order of shrubby plants, with tough caustic inner bark. The only British genus

is Daphne.

Thymus Gland, a temporary organ lodged partly in the anterior superior mediastinum, partly in the neck. It attains its full development at about the end of the second year of life, after which it gradually atrophies and at

puberty has almost entirely disappeared. Its function is unknown. Thyroid Gland (@vpcos, shield; cdos, like), one of the so-called ductless glands consisting of two lateral lobes, conical in shape, connected at about their lower thirds by an isthmus which passes transversely across the trachea. A third lobe called the pyramid sometimes arises from the upper part of the isthmus or from one of the lobes, generally on the left side, and ascends to the level of the hyoid bone. Occasionally this lobe is found to be Structurally, it consists lined with epithelium, detached. of follicles lined with producing a peculiar yellowish glue-like substance known as colloid. Its function is rather uncertain, but it is thought to be the production of some internal scoretion which counteracts poisonous productions of the system. Enlargement of the gland, which may be due to hypertrophy of any of its constituent parts, is called goitre, and is occasionally associated with a disease known as exopthalmic goitre. Cretinism or myxedema results when the gland is absent. Prepara-tions of the T. G. of animals are used

medicinally.

Thyrsus (Gk. θύρσος), the wand carried by Dionysus and the Bacchants when taking part in his orginstic

rites.

Thysanura, or Bristle Tails, an order of wingless insects, with long many jointed feelers and small paired limbs on several of the abdominal segments. They occur under stones or in damp earth, and often in human dwellings, one especially favouring bakers ovens. One of the best known is the 'silver fish' (Lepisma saccharina) often found among papers in drawers and cupboards.

Tian-Shan (Thian-Shan, celestia) mountains), a mountain system of Central Asia, forming part of the boundary between Russian and Chinese Turkestan and extending N.E. from the Pamir to the western fringe of the Gobi desert. The main range, including the ranges of Peter the Great Trans Alai Edishaltan the Great, Trans-Alai, Kokshal-tau. and Sary-yassy forms the border ridge of the High Plateau of E. Asla, ridge of the High Plateau of E. Asia, to which they slope on the S.E. In this chain, with a general elevation of 15,000 to 20,000 ft., are the chief peaks, Kaufmann Peak (22,500 ft.) and Khan-Tengri (24,000 ft.), and the largest glaciers, and it is crossed by passes at an elevation of 10,000 to 14,000 ft. On the N.W. slope are a capies of shorter frients chains. series of shorter fringing chains, running parallel to the main ridge. Among these are the Baisun-tau. Hissar, and Alai ranges; Bish-ilik, Chotkal, Talas, Ala-tau, and Alexandrovskw Range; the Trans-Ili, Kundral and Alexandrovsky Range; the Trans-Ili, Kundral drovsky Range; the Trans-III, Kunghei, and Terskei Ala-taus, the Dzungarian Ala-tau, the Nura-tau, Kara-tau, Chu-ili Mts., Uch-Kara, and the Chingtz-tau. In this region are the depressions of Kokan or Ferman Juris 1821, 1821 gana, Issyk-kul, Kulja, and Ebi-nor, and the gorges of the rivers Narym. Ili, Zerafshan, and Tarim. The general elevation of these minor chains is 10,000 to 19,000 ft. Forest rices to about 9500 ft.

Tiara, the papal triple crown, or symbol of sovereign power, not sacred like the mitre. It is a high cap of gold cloth, encircled by three coronets and surmounted by a gold cross.

Tiarini, Alessandro (1577-1668), an Italian painter, born at Bologna. He worked for seven years under Passegnano at Florence, with whom he acquired a great reputation. Ho then returned to Bologna and later adopted the style of the Carrael. His chief works are: 'Deposition from the Cross.' Miraele of St. Dominic,' and 'St. Peter's Repentance.'

Tibaldi, the name of two brother painters and architects: Pellegrino Tibaldi (1527-58), was born in Bologna, of humble parentage. He went to Rome and found his inspiration in the works of Michael Angelo. He painted the history of Ulysses for Cardinal Poggi's palace and also designed the Poggi Chapel. He also de-I moderation, signed the Palazzo della Sapienza at solicitude fo Paira, and the Duomo at Milan.

Domenico Tibaldi (1541-83) executed
the Palazzo Magnani, the Dogana,
and the cathedral chapel at Bologna.

Tibbu, a nomad race of the castern

Sahara, mainly concentrated in the region of Tibesti or Tu, hence their

region of Tibesti or Tu, hence their name. They number about 100,000. Tiber (Lat. Tiberis, It. Tevere), the chief riv. in Central Italy, on which stands the city of Rome. It rises in two streams issuing from the Apennines near Titernum, on the eastern frontier of Tuscany, and flows S.W., disting Ftynic from Univia. After dividing Etruria from Umbria. After flowing 110 m., it receives the Nera, and from its union with this river is navigable. Three miles above Rome it receives the Teverone, and within the walls of the city it is about 300 ft. wide and from 12 ft. to 18 ft. deep. The T. empties into the Sea by two arms, enclosing a dismal morass, once known as the Sacred Isle or Isle of Venus. Length 245 m.
Tiberius Claudius Nero (42 B.C.-37 A.D.), the second of the twelve

Cesars, was the stepson of Augustus, whom he succeeded on the imperial throne. He was the son of T. Claudius Nero and Livia, afterwards the wife of Augustus. He was carefully educated and became well acquainted with Greek and Latin literature. At the age of twenty-two he was sent by Augustus to restore Tigranes to the throne of Armenia. In 13 B.C. he was consul with P. Quiutilius Varus. Three years before this he had been given the charge of the northern wars, together with Drusus, and during the years from 12-9 Tiberius had con-quered Pannonia. He remained in Germany and the surrounding provinces until the year 6 B.C., in which year he obtained the tribunitia potestas for five years, and retired with the emperor's permission to Rhodes. He returned to Rome at the end of seven years, and in 4 A.D. he was adopted by Augustus. In the In the same year he took command of the Roman armies in Northern Germany, and here he remained during the next seven years, though he paid frequent visits to the capital. On the death of Augustus, Tiberius hurried home, and the skilful management of Livia to gether with his own address secured the throne to him without opposition. Tiberius was suspicious in character, and he began his reign by putting to death Postumus Agrippa, the sur-viving grandson of Augustus. Then he proceeded step by step to make himself absolute. Even Tacitus, however, who had no love for the early Carsars, admits that from 14-23

moderation, showing an especial solicitude for the interests of the provincials (Annals, Bks. L-III.). Tacitus, however, regards this good government as no more than a veil of hypocrisy, and he ascribes the de-parture of Tiberius from Rome in 26 A.D. to a desire to give full vent to his sensual inclinations in private. Tiberius had long hated Rome, and in 26 A.D. he left it never to return. He first went to Campania on the pretext of dedicating temples there, but in the next year he moved to Caprea, an island off the Campanian coast. his minister Sejanus. Meanwhile whom alone he seems to have trusted. and in whose hands the real government of the state had long rested, was plotting to obtain for himself the imperial power. In 31 A.D. he was put to an ignominious death, to which many of his friends followed him. On March 16 Tiberius died at the villa of Lucullus at Misenum, having been smothered by the order of Macro, the prefect of the Prætorians. The character acter of Tiberius has been one of the most disputed points in history. Tacitus and Suctonius unite in painting it in the blackest colours, but there is much which tends to show that their history cannot be taken too literally. He is defended by Dean Merivale in History of the Romans under the Empire, and by Professor Beesley in Calline, Clodius, and Tiberius (1878). See also Mommsen's History of Rome (vol. v.).

Tibesti, a mountainous dist. of the Sahara, in the region inhabited by the Tibbus. The camels are the most valued in E. Sahara, and the district also produces donkeys, goats, and

sheen.

Tibet, or Thibet, a country in Central Asia, nominally a dependency of China. It is bounded by the Kwenlun China. It is bounded by the Kwenium Mts. on the N., separating it from Eastern Turkestan, by China proper on the E., by the Himalayas on the S., separating it from British India. Bhutan, Nepal, etc., and by Kashmir on the W. The surface is an elevated table-land, the average height of which is 16,000 ft. above sea-level, the highest plateau in the world. The the highest plateau in the world. The Northern half of T. is almost devoid Northern half of T. is almost devoid of vegetation owing to the severity of the climate; there are numerous mountain ranges, and in the valleys are numbers of lakes, many of them salt, and also hot springs. To the S. of the Tangla Mts. the climate is less severe, it is therefore the most nearly near of T. Here also lie the populous part of T. Here also lie the upper courses of the great rivers, the Brahmaputra, the Indus, Sutlej, Ganges, Mekong, Salwin, Kwang-ho, and Yangtsze-kiang. To the N. of Tiberius governed with justice and the Brahmaputra lie great mountain

ranges with peaks that are of such immense height that they top the Himalayan Mts. to the S. Of these the most important are the Nienchen-tang-la and the Hlunpo-Gangri ranges. Gold is found in T. and according to some explorers there is a field of wealth in Northern and Eastern T. that has been scarcely touched. Buddhism into the country. In Mining is only carried on in a few places, and though some gold is ex-went to T. and was the first of the ported to China it is comparatively long line of lamas who have since places, and though some gold is exported to China it is comparatively Iron pyrites are found and little. Iron pyrites are found and lapis-lazuli and inercury in small quantities, and salt and borax are found among the lakes. The climate varies considerably, though for the most part cold and dryness may be said to be the prevailing characteristics. It is influenced by the S.W. monsoon and is subject to a great deal of wind. In certain districts the rainfall is very high and in parts extremes of cold and heat are felt. Sheep and cattle are reared, also goats, pigs, and poultry; and horses, mules, and donkeys are used. There are innumerable species of wild animals, including the yak, leopard, deer, antelope, bear, wolf, etc., and rare kinds of pheasants and partridges are also found. Trade is carried on principally with China, Turkestan, Mongolia, India, and Indo-China. The chief imports are silk, carpets, gold lace, tea, porcelain, leather, cotton goods, horses, and sheep, and the chief exports are wool and woollen goods, salt, rugs, furs, drugs, borax, and some gold and silver. The people of T. are of Mongoloid origin as far as is known, and they speak Tibetan; it is allied to Burmese, and comprises an almost endless author of dialogs. of cold and heat are felt. Sheep and and comprises an almost endless number of dialects. The religion of the country is Lamaism (q.v.). The religion Polyandry is a custom of the people, all the brothers in a family having the same wife. The country is divided into five provinces, Amdo, Khams, U which includes Lhasa, Tsang, and Näri. Though nominally dependent on China the real rulers of dependent on China the real rulers of T. have for many years been the Lamas, whose authority is vested in the Dalai Lama at Lhasa. There is a Chinese resident at Lhasa, who officially represents China and is known as the Amban, and other Chinese officials reside in the country. Certain taxes are levied by China, and they keep a few military stations in the country. At Lhasa there is a national assembly, or Tsong-du, which settles all the really important affairs of state, and is repossible for the foreign policy of the country. From very early days T. was the object of explorers, but field to India hoping to obtain help owing to its position their journeys were fraught with much difficulty, a revolution broke out in China, the Certain taxes are levied by China,

long line of lamas who have since ruled T. In 1253 all the eastern part of the country was conquered by Kublai Khan, and it was he who first placed the government in the hands of the lamas. It was not until 1720 that the country was finally brought under Chinese rule. India had always been anxious to open up trade with T. and between 1872 and 1886 three different missions were organised but were given up. In 1888 the Chinese invaded Sikkim and a military expedition was sent to drive them out, which resulted in a treaty (1890-93). The lamas not having been consulted in the matter they took offence, and revenged themselves by trying to bring about a treaty with Russia. Further incode were made into Sikhita page. roads were made into Sikkim, and Lord Curzon, then viceroy of India, came to the conclusion that strong measures were necessary. F. E. Younghusband was sent with an escort to see if he could come to terms, but he was unable to do anything. It was then decided to send an armed expedition, and in Dec. 1903 Colonel F. E. Younghusband (afterwards Sir) with General December 1903 Colonel Research of the service Ronald Macdonald in command of the troops set out, and after some severe fighting they renched Linsa on Aug. 3, 1904, and the Dalai Lama fled. Peace was concluded in September by a treaty which provided against further incursions into Sikkim and established British trade marts, and also prevented any foreign power receiving concessions in the country; the Tibetans also had to pay an indemnity; China signed an agreement to this in April 1906. A treaty with Russia was concluded in the following year, in which it was agreed that no concessions should be sought by either power and no expeditions dispatched without the consent of both countries for a term of three years. In 1908 the Dalai Lama was reinstated in Lhasa by Chinese

Tibetans took the opportunity to rise t against the Chinese, and in Aug. 1912 a treaty was signed which agreed that the Chinese should leave the country and return to China by way of India. The Dalai Lama then returned. In July 1912 the Chinese government sent out another expedition with the object of reconquering T., but in consequence of a memorandum sent to China by the British Government, drawing attention to the Anglo-Chinese treaty of 1906, it was with-The area is about 463,200 sg. m.

sq. m. Pop. about 6,607,800.

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The Land of the Lamas, 1891; Chandra Das, Journey to Lhasa and Central Tibet, 1899; H. Bower, Diary of Journey across Tibet (Calcutta), 1893; Syen Hedin, Central Asia and Tibet, Sven Hedin, Central Asia and Tibet, 1903, Trans-Himalaya, 1909-13; Sir I', Younghusband, India and Tibet, 1910; Colonel Sir I'. H. Holdich, Tibet the Mysterious; C. A. Sherring, Western Tibet and the British Borderland; F. Kingdom Ward, The Land of the Blue Poppy, 1913; E. Grenard, Tibet: The Country and its Inhabitants, 1904; C. G. Rawling, The Great Plateau, 1905; P. Landon, Lhasa, 1905 1905.

Tibullus, Albius (c. 54 B.C.-c. 18 B.C.), Tibullus, Albius (c. 54 B.C. -c. 18 B.C.), a Roman poet, was descended from an equestrian family, whose estate was at Pedum, between Tibur and Præneste. In the year 28 B.C. he followed his patron, Messala, into Aquitania and thence into the East, but was taken ill at Coreyra and had to return. His poetry, addressed to two mistresses under the names of Delia and Nemesis, has little ardour, but is marked by its air of gentle tenderness and self-abnegation; on the other hand his bucolic elegies are the other hand his bucolic elegies are some of the sweetest and best in the Latin language. Horace was warmly attached to him. There is a good selection of his poems by Postgate (1906), and an English translation by Cranstoun (1872).

Tibur, see Tivoli.

Tichborne Case, one of the most celebrated trials in the annals of the English criminal law. The prisoner, Thomas Castro, otherwise 'Bullocky Orton,' the big butcher of Wapping, was tried and convicted for perjury in putting forward in the civil courts a bogus claim to the Tichborne title and estate (1880). Not call did Orton and estates (1880). Not only did Orton in posing as Sir Roger Tichborne, son

Tic Douloureux, sec NEURALGIA.

of Sir J. F. Doughty Tichborne, Bart., answer with astonishing skill every

£70,000, in legal expenses. Castro was sentenced on two counts to two cumulative terms of seven years'

penal servitude each.

Tioino, or Tessin: 1. A canton of Switzerland, lying on the Italian slopes of the Alps. Area 1088 sq. m. It is for the most part mountainous, but in the S. merges into the Lombard plain. In the S. is the larger portion of the Lake of Lugano and part of Lake Maggiore. It is watered by the Ticino and its tributaries. The climate and products vary with alti-Cereals, tobacco, fruit, chesnuts, vines, and silk are cultivated. It was taken by the Swiss from Italy in 1512 and joined the League in 1803. Pop. 158,556. 2. A riv. of 1803. Pop. 158,556. 2. A riv. of Switzerland and Italy, which rises in the above canton near Nufenen Pass, flows through Lake Maggiore and between Piedmont and Lombardy, and joins the Po 31 m. S.E. of Pavia.

Length 150 m.

Tickell, Thomas (1686-1740), an English poet, was appointed professor of poetry at Oxford University in 1711. He wrote much minor verse, some of which appeared in The Spectator, and his translation of the Iliad appeared simultaneously (1715) with that of Pope, a proceeding which resulted in the historic quarrel between Pope and T.'s friend, Addi-His best work is Kensington Garden (1722). When Addison be-

came Secretary of State he made T. an under-secretary.

Ticket-of-Leave, see Prisons.

Ticknor, George (1791-1871), an American author, born in Boston. Having studled in various countries he became in 1817 Smith professor of French and Spanish languages and literatures, and professor of belles lettres at Harvard, but resigned his chair in 1835 to devote himself to the study of the history and criticism of Spanish literature, the result of which appeared in his History of Spanish Literature (3 vols. 1849). Amongst other works are: Outline of the Principal Events in the Life of General Lafayette, Lecture on the Best Methods of Teaching the Living Languages, and Life of William Hickling Prescott.

Ticks, or Ixodidæ, a family of Acarina, with flat bodies protected by horny shields. During part of their existence they are blood-sucking parasites on animals and birds, for which they have developed a rostrum or beak composed of two barbed harpoons above and below a dart. Eggs are laid on rough herbage and hatch question put to him in the civil into a white six-legged larva, which actions, but even the real Tichborne's mother at first' identified 'him as her missing son. The whole proceedings history on the coat, but in others cost the Tichborne family some returns to the grass for a period. T.

W. shore of Lake Champlain, 95 m. N. of Albany, with manufactures of paper and wood-pulp. Pop. (1910) 2475.

Ticunas, Indians found in the forests of Brazil and Peru around the confluence of the Javary and Marañon. They have dark skins and good physique, and adorn themselves with feathers, etc., but wear no clothes. They live by fishing and hunting. They are described as being a peaceful and harmless people. being a peaceful and harmless people.

Tideman, Philip (1657-1715), a

cause irritation and anomia, but their chief danger to their hosts is in the introduction of parasitic protozoa, causing such diseases as Texas fever and redwater.

Ticonderoga, a vil. of New York, U.S.A., in Essex co., situated on the U.S.A., in Essex co., situated on the gr80 x for the carth's centre subject to their hosts is in the moon can be simply determined. The moon can be simply determined sublun differe: and C and B. works g/88351 g/8833i verts a control of the contr verts a Tideman, Philip (1991-1119), are connected, in reality there is a and became a pupil and assistant of Lairesse at Amsterdam. He chose his subjects from aneient mythology, his chief pictures being 'Venus complaining to Jupiter of Juno,' and 'funo and Æolus.' The radius of the moon, M its mass, r the radius of the carth: attraction at $\Delta = M/(d-r)^2$; and separate more and more; as they Tides are regular disturbances of the fluids on the earth, produced by the action of the gravitational forces of the moon and sun. The earth that is subject to a stress due to the different degrees of pull exerted in the near and far side; this stress and its variations have not been determined empirically. Some evidence, but only extremely slight, of tidal action in the atmosphere is barometrically shown. In moon, M its mass, r the radius of the earth: r attraction at r and r attraction at r attraction at r and r attraction at r attraction at r and r attraction at r attraction at r attraction at r and r and

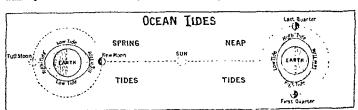


FIG. 1

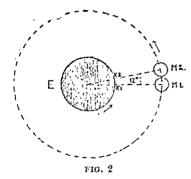
concerned to any appreciable degree. occurring at new and full moon, give Since gravitational attraction of a higher tide than the average and body varies directly as the mass and also a lower one than the average; inversely as the distance, that of the neap tides at the quarters are lower

The Oceanic waters are markedly disturbed, and the predominating influence of the moon is shown by the usual interval of 24 hr. 51 min. between similar phases being identical with the average interval between two successive passages of that body across the meridian.

Tide-raising forces.—The basis of tidal theory may be simply illustrated. The sun and moon are the only bodies are the meant tides. Spring tides concerned to any appreciable degree.

average. The principal tide here being that due to the moon, the sun raises the low at the expense of the high stides. When the moon is in perigee spring tides are higher, and if this occurs about Jan. 1, when the earth is nearest the sun, the highest tides are produced; in each case low tide is correspondingly reduced. The relative heights of spring and neap tides are about 7:4.

Rise and fall.—Since the earth with its waters is rotating, every place as it comes under the influence of ex-ternal attraction has its waters gradually lifted to a maximum, then gradually dropped to a minimum. The flowing or flood tide is the former, the ebb-tide the latter movement.



Alternating high and low tides should occur, according to Fig. 2, twice each in twenty-four hours; actually the average period is 24 hr. 51 min., since during the rotation the moon travels forward in its orbit, so that a place carried by the earth's rotation from high tide position, completes a full rotation, but has to travel in addi-tion another 12° or 2 hr. before coming again under the moon.

Priming and lagging.—The tides prime, or arrive early, at the time of spring tide, the average interval being about 24 hr. 38 min.; at neap tides the interval averages 25 hr. 6 min., and the tides lag. These differences are due to the constriction of solar and lunar tides. At new and full moon, when these tides coincide, the crest would be under the moon; at quadrature the solar wave crest and trough combining symmetrically with the lunar trough and crest respectively, produces merely a difference in height, not a displacement, other positions displacement In

at high, higher at low tide, than the to the W. of that of the moon, about half an hour ahead for the angle 45°, three days after full or new moon. The half-hour is gained from diminished intervals for the three preceding days. When the solar crest occurs to the E. of the lunar within a quadrant, the combined crest is found further E. and is reached later by a similar interval, giving lag.

Diurnal inequality. — Twice a month the moon being at its farthest point N. (28°) of the celestial equator, the tidal wave crest is found in the N. hemisphere, its antipodal crest in the S. A sublunar place is carried round by the earth's rotation in a plane inclined at an angle to the diameter forming the crests, so that its record high tide is not at the antipodal crest but to one side of it, the second high tide being thus less than the first; this is known as the diurnal inequality.

The theory of tides has been worked out very completely by George Dar-win, with very many interesting and important results. For example, Lord Kelvin concluded, from an analytical study of thirty-three years' observation, that the earth as a whole must be more rigid than steel, but perhaps not quite so rigid asglass. The friction due to tides involves a loss of energy obtained from the earth's energy of rotation, and tends to retard it, thus lengthening the day; there are counteracting forces, and in any case no difference has been actually noted; it could be only extremely slight, hardly as great as one-millionth of a second per year. Such a loss of gravitational speed would tend to accelerate the moon's orbital motion and cause that body to recede, thus lengthening the month. This forms the basis of Sir George Darwin's tidal evolution theory, which thus accounts for planets having receded from the parent body after separation.

Actual tides.—The configuration of

land and water, and the varying depth of the latter, are the chief elements in completely upsetting calculations from theory. High tides occur at all intervals before and after the meridian noon in different places. For any port the mean interval is known as the establishment of the nort; at New York it is 8 hr. 13 min., with a variation of 22 min. either way during the month; at London Bridge it is 1 hr. 58 min.; at Bristol, 7 hr.; Yarmouth, 9 hr. Height of tides.—In the open ocean

no accurate determinations have been made, but 2 to 3 ft. is the average height. Shallow seas, by will diminishing the velocity increase the occur owing to the combination of the leight, which may be exaggerated lunar and solar crests. This gives high again by entry into converging chantide, if the sun's influence is exerted nels or estuaries. A hundred feet, it is

said, has been recorded in the Bay of Fundy; at Bristol 50 ft. is attained, yet the E. coast of Ireland shows a range of only 2 ft. The effect of shallow water and projection and projection of Versuch einer Erklürung des Urles to Arganian and Projection rise to reflection and

to set up lidal curre true tide gives no .

water. Such currents may give rise literature at the Carolinum in Cassel to double tides as at Southampton, the (1776) and at Marburg (1786-1803). falling tide of the channel driving through Spithead, the rising tide through the Solent, each giving high water. Such currents entering river mouths give rise to the bore, eiger, or mascaret.

Uses.- Physiographically tides aid in the destruction of coast-line and help to carry debris to the sea; they prevent the formation of deltas, yet aid rivers in building their lower flood plains. Biologically they have immense influence, the sea-shore between tides having its peculiar life. Commercially they are useful in carrying vessels further inland, and lessen the need for wind or steam power.

Absence of tide. - Though theoretically tides are produced in all bodies of water, they are often inappreciable; thus Lake Michigan has probably a tide of 2 in. Enclosed seas such as the Mediterranean and Baltic have a tide

of anything up to 1 or 2 ft.

See Young, General Astronomy,
1896; Sir R. Ball, Time and Tide,
1889; Lar 295; Wheeler, . *l'ides* and Wave, and Waves '(Ency. Met.); and Darwin's papers in Phil. Trans.

Tidesvell, a small tm of Derbyshire, England, 61 m. E. of Buxton, and in the vicinity of Monsal Dale. Limekilns, quarries, and lead mines are in the vicinity. Pop. (1911) 1985. Tidore, an island belonging to the

Moluccas, Malay Archipelago, situated off the W. coast of Halmahera. It covers an area of 30 sq. m., its surface consisting of forest-clad volcanoes. Cotton and tobacco are cultivated and fishing is an industry. Cap. Tidore, on the E. coast. Pop. 8000.
Tieck, Johann Ludwig (1773-1863),
German writer of novels, criticism.

and dramas, born at Berlin. He was the son of a rope-maker and made his debut as a literary man by some sketches written after the French fashion of the day and published in the review Straussfedern. He was a great admirer of Shakespeare and a romantic writer, who showed his pre-deliction for the bizarre and fantastic in a gloomy story in three volumes entitled William Lovell (1795). About this time he published his tale of Peler Lebrecht (1796), some poems (Der Blonde Eckert), and a play Die Werkerte Welt.

Tiedemann, Dietrich (1748-1803), a

professor of ancient

(1776) and at Marburg (1786-1803). Tiedge, Christoph August (1752-1841), a German poet, born at Gar-delegen i ings are

den Mar Frauensp

were edited by Dr. Falkenstein soon

after his death.
Tiel, a tn. of Holland, in the prov.
of Gelderland, on the Waal, 14 m.
N.N.E. of Bois-le-duc, with a very considerable trade in grain. 11,358.

Tiele, Cornelis Petrus (1830-1902), a Dutch theologian and scholar, born at Leyden. He was professor of the history of religions from 1877-1901. His best known works are On the Elements of the Science of Religion, 1897-99; Outlines of the History of Religion, 1876.

Tientsin, a treaty port and city of China, in the prov. of Chi-li, at the junction of the Peiho with the Grand Canal, 76 m. S.E. of Pekin. It is the emporium for Northern China, with an extensive trade. The exports consist chiefly of coal, skins, cotton wools, groundnuts, beans, peas, and dates. Pop. 850,000. Tierce: 1. Formerly a liquid

measure equivalent to 42 gallons, or 35 imperial gallons. 2. In music, a major or minor third. 3. In gaming, a sequence of three eards of the same colour. 4. A thrust in fencing. 5. In heraldry, a term for the field whon divided into three equal parts of different colours or metals.

Tierney, George (1761 - 1830), a statesman, entered Parliament in 1788. He was a persistent critic of Pitt, with whom he fought a duel (1798), and

measures. H navy under . in 1806 was Board of Cor. .

of his party in opposition from 1817

to 1821.
Tierra del Fuego (Land of Fire), a group of islands separated from the southern extremity of S. America by the Strait of Magellan. It consists of several large islands, called Tierra del Fuego or King Charles' South Land, Navarin, Hoste, Clarence, Santa Inex, besides a number of much smaller size, the most important of which contains Cape Horn at the extreme S. The highest peak is Mt. Sarininto type. T. was discovered by Magellan

Tiers

in 1520.
Tiers Etat, see States-General.
Tietiens. Teresa, see Tittes TITIENS. TERESA.

Tiffin, a city and co. seat of Seneca co., Ohio, U.S.A., on the Sandusky R. It is the seat of Heidelberg University (Reformed Church). Pop.

(1910) 11,894. Tiflis: 1. A gov. of Transcaucasia, Russia, bounded on the N.E. by the crest of the main Caucasus range and formerly part of the kingdom of Georgia. Area 15,776 sq. m. The is mentioned in the Bible. He assurface is mountainous, the district containing the Caucasus in the N.E., the Mesques Mts. in the N.W., and the Anti-Caucasus in the S.W. It is vines, and fruit are grown. Cattle, sheep, and goats are reared, and silk-worms cultivated. The mineral wealth includes gold, silver, iron, copper, naphtha, and rock salt. Pop. 1,183,300. 2. The cap. of above gov., and of the lieutenancy of the Caucasus, on R. Kura, 275 m. N.W. of Baku. It is a trading centre, and has numerous manufactures hot and sulphur springs. Pop. 196,935.

Tigellinus, Sophonius, son of a native of Agrigentum, the minister of Nero's worst passions, and of all his favourites the most obnoxious to the Roman people. On the accession of Otho, T. was compelled to put an end to his

own life. Tacitus. Annals, xiv., xv.
Tiger (Felis tigris), a huge and powerful carnivore, peculiar to Asia, though absent from Ceylon, Afghanistan, Baluchistan, and Tibet. The istan, Baiuchetan, and Tibet. The Indian T. rarely exceeds 10 ft. in length, and the female averages about 8 ft. 6 in. Fine males weigh from 400 to 500 lb. Young animals, which are characterised by their canine teeth being hollow throughout, are handsomer then older ones, the transport of the property of the transport of the tr the tawny orange colour being richer and the stripes darker and closer together. Ts. are monogamous, though there is no reason to suppose that they pair for life. The period of gestation is fourteen or period of gestation is fourteen or fifteen weeks, and from two to five cubs are born, though seldom more than two are reared. Ts. will eat carrion, but generally kill for themselves. Their food consists principally carrion, but generally kill for themselves. Their food consists principally of deer, antelopes, and smaller animals, but occasionally powerful ones he are attacked, and they sometimes kill frontier mountains of Armenia and the case with lions, old and worn out, The chief headwater flows E., passing and many are in splendid coat when S. of Lake Gelik, S.E. and S. to killed after a meal on human flesh. Diarbekir, and E. to Til, where it

(6900 ft.). Pop. 1000, savages of low | The taste is generally acquired during a hunt from which the animal escapes after having mauled a man, but even man-eaters are known to hunt for other food.

Tiger Beetles (Cicindelidæ), a family of beetles characterised by their large head and long legs, adapted for fast running in the pursuit of the small insects on which they feed.

Tiger Flower, see TIGRIDIA.

Tiger Lily, see LILY. Tiglath-Pileser, the name of several cended the throne in April 745 B.C. The revolution in the northern kingdom of Israel, which set Pekah on the throne of Samaria, appears to have watered by the Kura and its tribu-coincided with a confederacy being taries. Much of the land is forest, formed against Assyria; the refusal and there are considerable arid of Ahaz to join it was the occasion of stoppes, but in the valleys cereals, the determined assault made on the kingdom of Judah by Pekah and Rezin which led to the appeal to T. by Ahaz. In this campaign T. besieged Damascus, and, apparently masking it, he proceeded to the conquest of Gilead and Galilee, de-

porting the inhabitants.

Tigranes, or Dikran, the name of several kings of ancient Armenia, one of whom flourished as early as 550 B.C., and was a friend of Cyrus the Great, helping to overthrow Median empire. The best kn The best known bearer of the name (c. 121-55 B.C.) is the son-in-law of Mithridates the Great. He was king of Armenia (c. 96-55 B.C.), and master of the Syrian monarchy from the Euphrates to the sea (83), founding the city of Tigrano-certa. T. at first supported Mithri-dates against the Romans (76), but was defeated by Lucullus (69-68) and by Pompey (66).

Tigré, one of the three main divisions of Abyssinia, Africa, a district in the N.E., lying above the Takazze's defile. T. is bounded N. by Eritrea. defile. T. is bounded N. by Eritrea. S.W. by Amhara. Adua (cap.) and Ascum are its chief towns. Nominally subject to King Menelik II. of Shoa since 1889, T. has been partly attached in the N. to the Italian Eritrea. The inhabitants are a Semitic race.

Tigridia, or Tiger Flower, a genus of bulbous plants (order Iridaceæ), natives of tropical America. They are grown in the cool greenhouse and also in warm borders where the bulbs

the wild boar. Man-eaters are not, as is Kurdistan, near Kharput and Bitlis.

receives the Bohtan Su or Chai, which rises about 20 m. S. of Van and then flows W. to this point. The stream then flows S., entering the plains at Jezire, and then S.E. to Kurna, where it unites with the Euphrates to form the Schat-el-Arab. The chief tributaries are the Great and Little Zab and the Diala or Shirwan, all coming from the E. On the banks are Mosul, Tekrit, and Bagdad, and the ruins of Nineveh, Seleucia, Ctesiphon, the ancient Mesopotamia lying be the ancient Mesopotamia lying between it and the Euphrates. Length 1150 m., navigable by steamers to Bagdad.

Tikhvin, a tn. of Russia in the gov. of Novgorod, on Tikhvinka R., with distilleries and flour mills. Pop. 7000.

Til, or Teel, the seed of Sesamum indicum and S. orientale, cultivated in India and other warm countries. The seed is used for food, and the oil derived from it is employed in soap

making and as an illuminant.

Tilburg, a tn. of N. Brabant prov.,
Holland, 14 m. from Breda. It is a great industrial centre, manufacturing cloth, woollens, soap, leather, etc. Pop. 52.754.

Tilbury Fort and Docks, a fortifica-tion in Essex, England, on the Thames opposite Gravesend, enclosed by a moat. Originally built by Henry VIII., it was enlarged by Charles II. The troops sent to crush the Spanish Armada were reviewed here (1588). The docks (c. 75 acres in area) were opened 1886, and now belong to the London and India Docks Company Tilden, Samuel Jones (1814-86), an

born e was

Tilia, a genus of tall trees Tiliacece) with cymes of fre.

tough fibrous inner bark. Jute derived from the genus Corchorus.

Till, see Boulder Clay.

Tillandsia, a large genus of mostly epiphytal plants (order Bromeliacem) natives of tropical America. number are grown for their hand-some foliage and showy bracts in the stovehouse. T. usneoides, a native of Jamaica, is able to retain rain in the expanded becase it is leaves and the expanded bases of its leaves, and this sometimes used for drink bу animals and travellers.

Sebastien Lenain de Tillemont, Sebastien Lenain de Tilly, (1637-98), a French ecclesiastical historian, born at Paris. At the age Tilsit, a tn. of E. Prussia, on the of twenty-three he entered the epis-of twenty-three he entered the epis-copal seminary of Beauvais. In 1672, Königsberg. There are iron-foundries,

during the author's life at intervals from 1690 to 1697, the remaining two after his death, in 1701 and 1738; and his Memoires nour servir à l'Histoire Ecclesiastique, which extended to 16 vols., of which the first appeared in 1603, and the fifth was in the press at the time of his death. These five volumes came to a second edition in 1701-2, and were followed in 1702-11

by the remaining cleven.

Tillicoultry, a tn. of Scotland,
Clackmannanshire, on the R. Devon. 4 m. N.E. of Alloa, with manufs. of shawls and shirtings. Coal is worked.

Pop. (1911) 3105.

Tillotson, John (1630-94), Archbishop of Canterbury, born at Halifax, of a Colvinist family; educated at Cambridge. At the Restoration he conformed to and became II. (1666). In : οf Canterbury, St. Paul's, in 1689 Dean of St. Paul's, and in 1691 Archbishop of Conterbury. He was a strong anti-Catholic, and published Rule of Faith (1666), four lectures on the Socialan controversy, and numerous sermons.

and numerous sermons.

Tilly, Johann Tzerclas, Count von (1559-1632), born in Brabant and brought up by Jesuits. He first saw service in the Spanish army in the Netherlands. Later, he left the 1874 became governor of New York. Spanish service for Austria, and He endowed a free library in New in 1607 became general of the

 himself during Tiliaceæ) with cymes of fre white or yellow flowers followed by great battle of White Hill, near nut-like fruits. Sec Lime or Linden. Prague, in 1620, and was also victori-Tiliaceæ, a netural order of trees ous at Wimpfen, Stadtloin, Wiesand shrubs, many of which have a loch, and Kochst. In 1630, T. was tough fibrous inner bark. Jute is appointed commander in-chief of the lateral from the great Carlotter. Imperial forces, and besieged and a flerce took Magdeburg, after struggle. Four months later, howand shortly after, again on the banks of the Lech, where he was mortally wounded, and died at Ingoistadt the following day. See Klopp, Tilly in 30-jährigen Kriege, 1861: Wittich, Magdeburg, Gustav Adolf und Tilly; Keym - Marcour, Johan Tycrolacs Graf v. Tilly: Count Villermont, Tilly, ou la Guerre de Trente Ans,

glass, cloth, and machinery manufs., ! and trade in grain, coal, cattle, etc. Here Napoleon I. concluded treaties with Russia and Prussia in July 1807.

Pop. 39,010.

Timæus (c. 352 B.C.-c. 256 B.C.), a Greek historian, was the son of Andromachus, tyrant of Tauromenium in Sicily. He was banished from Sicily by Agathocles, and passed his exile at Athens, where he had lived fifty years at the time when he wrote the 34th book of his history. This, his greatest work, is a history of Sicily, from the earliest times to 264 B.C. See Introduction to Holden's ed. of Plutarch's Life of Timoleon. xxiii.-xxxii.

Timæus of Locri, a Pythagorean philosopher contemporary with Plato. To him is usually ascribed the work, περὶ τῆςτοῦ κόσμου ψυχῆς. ('Conπερί τήςτου κόσμου ψυχής. ('Concerning the Soul of the Universe'), written in the Doric dialect. It deals with the same subjects as Plato's dialogue, Timæns.

Timanthes, a celebrated Greek painter, flourished about the begin-ning of the 4th century B.C. He was Greck a contemporary of Zeuxis and Parrasius. His masterpiece was the Sacrifice of Iphigenia. He was a See Tarbell's Hisnative of Sicyon. tory of Greek Art.

Timaru, a scaport of S. Island, New Zealand, 95 m. S.W. of Christchurch. It manufactures flour and woollen

goods. Pop. 7700. Timbrel, or Tobret, a musical instrument of the Hebrews, like the modern tambourine. It was used by Miriam after the passage of the Red Sea, and by David when he danced before the

Ark.

Timbucktoo (Timbuktu, Timbuctoo, or Tombouctou), a tn. of French Equatorial Africa, near the Sahara, 9 m. N. of the main stream of the Niger. Its position makes it a focus of caravan routes between Algeria. Morocco, and Tuab, and of traffic on the Niger, and it thus has considerable importance as a trade centre.

It experts established the state and salt It expc (from Senega

and Morocco. Most of the houses are of straw and earth, but there are a few brick buildings, some mosques and schools, and a citadel and forts. In 1904 it combined with Zinder-Chad to form the military territory of the

Niger. Pop. 5100.

Time, a certain fixed portion of duration. It may be chosen by reference to some regular occurrence of any natural phenomenon. Thus the day is determined by the apparent revolution of the sun and the year by the rotation of the earth on its axis. Sidereal T. is only employed in

astronomical work, the sidereal day being defined as the interval between two consecutive southings of a particular star. Thus the sidereal day is of constant length. Apparent time is taken from the revolution of the sun, the solar day being defined as the interval between two consecutive southings of the sun. This interval is by no means constant, due to the inclination of the ecliptic to the equator and the lack of uniformity in the velocity of the sun. The mean solar T. is the average of the apparent T., the maximum divergence being about sixteen minutes. T. can easily determined by travellers observing the transits of known stars across known vertical circles. At sea, the method usually employed is to note the altitude of a Nautical almanac star, and the latitude, and from these, together with the T. indicated by the chronometer, the T. can be computed. Local T. varies with the longitude, it being one hour in advance or behind the true Green-wich T. for every 15° to the E. or W. of Greenwich respectively. Owing to the confusion from the various local Ts., a standard T. has been intro-duced, the Greenwich T. being taken as the standard.

Time Recorders are instruments for checking the time of arrival and departure of employees. Several systems are in use, e.g. signature, key, card, and various other methods. The essential feature of the machine in each case is a clockwork arrangement which works a printing mechanism which is set into operation by the employer. The 'Kosmoid' by the employer. The 'Kosmoid' recorder gives the best illustration of the signature system. In this recorder the clock drives a disc which is graduated into sixty divisions, each division representing a minute. This disc actuates one graduated for the hours, the hour disc being released one division for each revolution of the minute disc. The employee signs his name on a strip of paper which passes through the top of the recorder, he then presses a lever, thus bringing the paper into contact with the discs which print the time opposite the signature. When the lever is released, the mechanism moves the strip forward so as to allow room for the next signature, the roll being collected on a stock drum. In the key method, a key with number in raised figures is

Times, The. This celebrated daily paper was founded in 1785 under the title of the Daily Universal Register, the name being changed to the T. in 1788. The early success of the T. was due to the personality and organising genius of John Walter. Briefly, his policy was

provided for each employee.

of prompt and accurate news, fearless independence in political criticism, and the consistent support of the Anglican Church. He wrote nothing himself, but he inspired everything. He early secured the services of Peter Fraser, pre-eminently the writer of the great leaders (see Journalism). On the death of John Walter in 1812 the T. passed into the hands of his second son, John. The editors at this period were successively Dr. Stoddart, its first professional editor, and Tom Barnes, a parliamentary reporter. On Stoddart's dismissal for the violent expression of his political antipathies, Southey was offered but declined the post. The T. at this period (1814) was far behind the Morning Chronicle as a 'commercial proposition,' but Walter by adopting Koenig's idea of printing by steam soon carried the T. ahead of all rivals (see JOURNALISM). As a consequence of this the historic turning-point in its career, its circulation and advertisement revenue increased enormously and enabled the proprietors to clinch its power as the voice of the nation all over the civilised world, an ascendancy which it retained unquestioned for the rest of the century and still retains to a certain extent. One of its most eminent contributors in the thirties was the celebrated Captain Sterling, whose powerful support of the Peel administration in 1835 earned that stateman's grateful personal stateman's grateful personal ac-knowledgments. It was this man's writing that earned for the paper the sobriquet of the 'Thunderer.' But the T. as England knew it in the eighties, was peculiarly the creation of its greatest editor, John Delane (see Journalism). He, like Walter, left the impress of his discretion upon the impress of his discretion upon every article that appeared. The T. has always succeeded in securing as contributors some of the most dis-tinguished men of its time, a fact which may explain why, notwith-standing the appearance in more recent years of the most formidable rivals, its articles have a weight and authority which they would probably authority which they would probably lack if they appeared in any other paper. At one time or other, Beaconsfield, Lord Chancellor Brougham, Cardinal Newman (as 'Catholicus'), Lord Grey (as 'Senex'), Lord Macaulay, Sir William Harcourt (as 'Historicus'), Moore, Dean Stanley, Lord Sherbrooke, and Dr. Croly, contributed to the T. The T. in recent, years encountered difficulties recent years encountered difficulties and went into liquidation. Lord Northeliffe, however, took the paper over and his characteristic enterprise scon showed itself in many ways. laki (10,000 ft.)
The price was reduced from 3d. to 2d., peaks. Among

to eschew satire and gossip in favour | financial, colonial, commercial, and literary supplements were vastly improved, and its general tone of complacent old-world Toryism gave way to a more generous outlook.

Time - tables, BRADSHAW, sceGEORGE.

Timgad, a decayed city of Algeria in the prov. of Constantine, 64 in. S.W. of the tu. of Constantine. It was founded by Trajan about 100 A.D. Timoleon (c. 411-337 B.C.), a great Greek democrat, came of one of the noblest families of Corinth. His

whole life was spent in a ceaseless struggle for liberty, and in his youth this led him to a sad excess—the murder of his own brother Timophanes, who was trying to make himself tyrant of Corinth. In 344 B.c. the Greek cities of Sicily sent to Corinth for aid against the Carthaginians, and T. was sent with a correct transfer of the core with a core of the cor small force. He took possession of Syracuse, and set about the establishment of democratic government in all the Sicilian colonies. Meanwhile the Carthaginians landed at Lilybreum (339). T. was not able to collect more than 12,000 men, but with these he marched against the Carthaginian troops and totally defeated them. A treaty was concluded in the next year, and T. continued his work. The flourishing state of Sicily at the time of his death shows how beneficial his influence was. Holden's ed. of Plutarch's Life of Timoleon (1889) and introd. to this.

Timon the Misanthrope, an Athenian who lived in the time of the Peloponnesian War. On account of ingratituc

suffered, he s society of all

He is the central figure of Shake-

speare's Timon of Athens.

Timor, or Timur, an island of the Malay Archipelago, largest and most easterly of the Lesser Sunda group. T. is separated from Ombay (N.W.) by Ombay Passage, and from Australia by the Timor Sea. Its area is about 17,700 sq. m. In 1859 a treaty divided the Island between Portugal and Holland, the boundaries being finally arranged by a convention (1904), which was ratified (1908). Portuguese T. includes the N.E. of the island with the territory of Ambeno, and the island of Pulo Cambing, Dilly (Deli) being the capital and chief port. Dutch T. comprises most of the S.W., including Parti Person Cambon Ca Rotti, Peman, Savu, Sumba, Allor, and E. Flores, with Kupang as the capital. The soil is dry and not very

cattle: among the imports muskets, gunpowder, hardware, calico, etc. A noted breed of ponies is reared here. Pearls have been found off the S.W. The staple article of food is Pop. (Dutch), estimated at See Van der Lith, Nederlands Indië, 1893-94; Forbes, A Naturalist's Wanderings in the Eastern Archivelage 1895-1895 (Panderings In the Eastern Archivelage 1895). pelago, 1885; Zondervan, 'Timor en de Timoreczen,' in Tydschr. Aardr. Gen., v., 1888; Dores,' Apontamentos para um diccionario chorographico de Timor,' in Bol. Soc. Geogr. Lisbon, xix., 1901.

Timor-Laut, a collection of islands belonging to the Malay Archipelago, 265 m. E.N.E. of Timor, belonging to the Dutch. The chief islands are Yamdena, Selaru, and Larat. The chief industries are agriculture, cattleraising, and trepang-fishing. Area of group 2060 sq. m. Pop. 24,858.

Timoteo da Urbino, or Della Vite

(1469-1523), an Italian painter, born in Ferrara. He studied first under Francia, but later went to Rome and worked with Raphael. He spent some fifteen years at Urbino and executed an altar-piece and a 'Magdalen' for the cathedral of that city. He also painted the 'Noli me tangere' for Angelo the brotherhood of Sant' Minore, at Cagli.

Timotheus, an Athenian general of 4th century B.c. In 375 he defeated the Spartan fleet and took Coroyra, and in 373 was sent to relieve Corcyra then besleged by Sparta. He served the king of Persia for some time, but returned to Athens, and in 366-65 took Samos, and in 363-62 he besieged Amphipolis. He was ruined by an unjust charge preferred by Charcs

in 355.
Timotheus of Miletus (c. 446-357 B.C.), a Greek dithyrambic poet and musician. He added an eleventh string to the lyre and thus gained the displeasure of Athens and Sparta. His poems, on mythological and his-torical subjects, are daring in treatment and style. His fragments are printed in Bergk's Poelalyrici graci.

Timothy, the young friend and fellow-labourer of St. Paul. He was a

coffee, wax, copra, sandalwood, and of claborate instructions for the appointment of officers and the pastoral care of the Christian churches. They show many points of contact with one another and with the other Pauline epistles, but there are numerous departures from the latter both in diction and subject-matter. They are private letters of an official One of the most disputed nature. questions is their authorship. In spite, however, of many attempts to disprove the Pauline authorship, the balance of probability still rests decidedly with the traditional view. The only considerable objection is the difficulty of finding a time and place for these epistles in the recorded life of St. Paul, and it is now usual, therefore. to place them somewhere in the unrecorded portion. The second epistle is, therefore, placed during a second imprisonment of Paul, of which no Many good record has remained. reasons have been adduced in support of the hypothesis that St. Paul's activities did not end with the first imprisonment, but that much of his evangelical work took place after that date. For a full description of the pros and cons of this discussion, see articles in Hastings' Dict. of the Bible, and in the Temple Dict. of the Bible (1910).

Timothy Grass, see Phleum. Timur Beg, or Tamerlane (1335-1405), a sultan of Samarkand, born at Kesh, of Mongol origin, a direct descendant of Genghis Khan. His father was the chief of the Turkish tribe of the Berlas. At the age of twelve, he was a soldier, and on the death of his father he began a life of conquest. He first assisted and then attacked Husein, Khan of Northern Khorasan and Jagatai, finally supplanting him in 1369. He made Samarkand his capital and rapidly made himself master of the whole of Turkestan and part of Siberia. next attacked N.E. Persia. Af next attacked N.E. reisia. Alter series of bloody and cruel conflicts, the whole of Persia, Georgia, Armenia, and the neighbouring states accepted him as suzerain. Timur After a accepted him as suzerain. Timur then turned his arms towards the N. and overran Kiptshak. During the years from 1392-96 he was employed native of Lystra, his mother Eunice in consolidating these conquests. He native of Lystra, his mother Eunice in consolidating these conquests. He being a Jewess and his father a Greek. then declared war against India, and He accompanied St. Paul on the in 1398 defeated the Indian army second missionary journey, and the near Delhi. He later came into consilves of the two are henceforward flict with Europeans, when he atclosely connected. He was left as the tacked and took Smyrna, the proapostle's representative at Ephesus, perty of the Knights of St. John. He where he was the recipient of two deld as he was marching to attack epistles from him. Euseblus says that he met his death there in a popularriot. In am Tamerlane is a European constitution of Timur-lenk (Timur the Epistle to Titus the group known as the Pastoral Epistles, which consist Marlowe's great drama, Tamburlaine.

Tin (Sn, 119), one of the seven | Church of England (1688), and later metals of the ancients, occurs as the oxide—tinstone or eassiterite (SnO₂)
—and is found in Cornwall, Austria,
and New South Wales. The metal
prepared from the ore (see Cassiwhite is and .lustrous (sp. gr. 7.3), and melts at 232° C. It is crystalline in structure and when bent emits a curious crackling sound called the 'cry of tin.' T. is not acted upon by the air and is therefore used for tinning iron (see TINPLATE). readily dissolves in hydrochloric acid with evolution of hydrogen and the formation of stannous chloride (SnCl2). It is not acted upon by dilute sul-phuric acid but dissolves in the con-Stannic oxide centrated acid. formed in the hydrated condition by the action of nitric acid on the metal, while aqua regia acting on the metal forms the tetrachloride (SnCl.). forms two series of salts, the stannous, in which it is divalent, and the stannic salts, in which it is tetravalent. The stannic salts correspond with similar compounds of carbon and silicon, the

acid-forming oxide towards strong bases. The alloys of T. are of great value, the most important being gunmetal, solder, bronze, and bell-metal.

metal, solder, bronze, and bell-metal. See PUTTY PowDer, etc.
Tinamou, any individual of the Tinamide, a family of game birds inhabiting the forests of tropical and Southern America. They resemble partridges in appearance, but have little or no tail. The wings are short, but they are able to fly with great. but they are able to fly with great

sneed.

Tinca, see Skin Diseases.

Tincal, see BORAÆ.
Tinchebrai, a tn. in the dept. of Orne, N.W. France, 13 m. N.N.W. of It manufactures paper, hardware. T. was the Domfront. tools, and hardware. scene of a battle between Ro' Normandy and his brother, H. of England, in 1106, after whic mandy was annexed to the . crown. Pop. 3900.

Tincture, an alcoholic solution of the medicinal constituents of a drug. Some Ts. are prepared by simply dissolving the drug in spirit, some by maceration only, and others by a combination of maceration and per-

colation.

the field of an escutcheon.

HERALDRY Tindal, Matthew (c. 1653-1733), an English deist, studied at Oxford, be-

wrote controversial pamphlets, which all met with vehement opposition from the High Church party. & Curll's Memoirs. 1734; Hunt, Fligious Thought in England, ii. 431.

Tindal, Nicholas (1687-1734), an English divine and historian, nophew of Matthew T. In 1724 he published Antiquities, Sacred and Profune, etc., after which he commenced and gave up a History of Essex. His best up a History of Essex. His best known work is his translation from the French of Rapin's History of England.

Tinder, an inflammable material, usually made of half-burned linen. Before the introduction of matches it was formerly one of the chief means of procuring fire. Partially decayed wood, especially that of willows and other similar trees, also affords T., and certain fungi furnish the German

T., or amadou (q.v.).
Tinea, a term applied to certain skin diseases, caused by the action of parasitic fungi. See RINGWORM.

parasitic fungi. See Hingwong.
Tineidee, a very large family of
small moths, among the best known
of which are the clothes' moths.
Tinfoil, see Foil.
Tinned Meat, see Canning.
Tinnevelli, the chief town of the
district of the same name, Madras,
British India. It is now the headquarters of Protestant missions. Ιt is famous for its temple to Siva. Pop.

40,000.
Tinnitus aurium (Lat. tinnire, to tinklo), a ringing in the cars. It is caused by abnormal stimulation of the auditory nerve, and may be set up by the presence of water or other substances in the aural cavity, or by disturbances of the cerebral circulation due to unaccustomed or over-

stimulating food.
Tinos, see Tenos.
Tin-plato, consists of sheet wrought iron or mild steel superficially coated with tin. Sheets of iron are cleaned by - arm dilute sulphuric

oured with sand and ibbing between hard

them, they are an-ed in acid, and nealed, immersed in acid, and scoured, and then dipped into tin melted under tallow. Excess of tin is squeezed out by pas-ing between rollers immersed in melted fat. The tinned surface prevents the iron from mbination of maceration and per-lation.

Tincture, in heraldry, the colour of fruit, meat, and fish, etc.

Tin-plates and Sheets. All iron and nust first bo

to remove there to im-

coming fellow of All Souls (1678), purities. Pickling agents formed a After having joined the Church of well-kept trade secret, but to-day it Rome (1685), he returned to the is accomplished by sulphurle acid, the

specific gravity of which is about 1.66. | mixture of lead and tin, containing In order to prevent the oxidisation of the surface of the molten tin and by way of a flux, grease is placed on top of the tin-bath. In old days a specially prepared beef-tallow was employed, then sal-ammoniac (NH₄Cl) was used under the name of muriate of ammonia. But to-day zinc chloride and palm oil hold the field. There are There are three chief processes by which the tin can be deposited upon the iron or steel sheet: (1) by the blanching process, (2) by fat tinning, (3) by electro-deposition. In the first named alkali stannates are employed in a boiling solution, with the addition of granular tin. After washing and drying, the tinned article-usually small in size—is ready finished. Electro-tinning may be either performed by the feeble current set up by depositing the article to be tinned in an aluminium receptacle suspended in an ammoniacal solution, or else by a direct electrolytic process, using an alkaline solution of stannous chloride as the electrolyte and sheet of tin as the electrode. The most frequently employed process is, however, the fat-tinning, by which all the poorly tinned stuff for making 'canned goods' is provided. The amount of tin used for such goods is as low as 2 lb. of pure tin spread over about 63,000 square inches of the surface, whereas in the very best quality, such as is employed for dairy articles, the amount of metal may rise as high as 6 lb. for the same be tinned by Sheets to through several fat-tinning pass operations before they are completely finished. After being pickieu and boshed, they are close annealed at a bright cherry heat for about ten After they have got quite cold, the sheets are cold rolled between two chilled rollers, which imparts fine dense surface to the sheets. This process hardens them and necessitates a second annualing and a further pickling. Forty years ago the sheets were all hand-dipped, i.e. they were dropped first into the flux-bath and then were removed to the tinnot covered with palm-oil. they were rapidly brushed and passed through a second similar pot at a slightly higher temperature. unfortunately gave an uneven coating of metal, so that a great improvement was effected when the last pot contained rollers revolving in the palm-oil, which squeezed off any superfluous tin. This process is the one in use to-day. Plates larger than 21" by 30" are known as tinned sheets in the trade, and are made up as large as 36" by 72" or even larger if necessary. Terne plates are coated with a

up to 25 per cent. tin. They are largely used for motor-car construction, such as wings and under-shields. They are also suitable for making articles which are not intended for containing food stuffs, owing to the possible risk of lead poisoning. See Taylor, Gauges at a Glance: Manufacture of Tin-plates, 1. of Mech. E., July 1906.

Tinsel, the name given to very thin glittering bits of metal used to ornament articles of dress, or the fabric in which such spangles are woven or attached.

Tinsley, William (1831-1902), publisher, brought out Miss Braddon's first novel, Lady Awlley's Secret (1862), and the early books of many authors who afterwards In 1868 founded Tinsley's famous. His firm went bankrupt Magazine.in 1878. He published in 1900 his RandomRecollections of anPublisher.

Tintagel Head, a promontory of Cornwall, England, is 300 ft. high, 5 m. N.W. of Camelford. On it are the ruins of Tintagel Castle.

Tintern Abbey, ruins, in the co. of Monmouthshire, England, on the Wye, 4 m. N. of Chepstow. They date back to 1131, and were purchased in 1900 by the Government.

Tintoretto, Jacopo Robusti (1512 94), the chief painter of the later Venetian school, born at Venice. He at first studied under Titian, but later he worked on his own account. Among his numerous works are: 'St. George destroying the Dragon,'
'Christ washing the Feet of the Disciples' (both in the National Gal lery), 'The Miracle of St. Mark,' 'The Crucifixion,' 'The Marriage at Cana,' 'The Paradiso' (in the Doge's Palace, the largest picture in existence, \$4 ft. by 34 ft.), 'The Golden Call,' 'The Last Judgment,' and a series of fifty-seven works in the Scuola di San Rocco. Tintoretto also painted portraits with considerable success, being especially skilful in depicting human flesh.

Tinworth, George (1843-1913), a modeller to the Doultons, Lambeth Pottery, born in Walworth. He has executed various works in stoneware and terra-cotta, some of which can be seen in the Guards' Chapel, York Minster, and Wells Cathedral, and amongst his panels an excellent is contained example Cathedral.

Tippecanoe, a riv. of Indiana, U.S.A., and a trib. of the Wabash R. Its length is 200 m. It was on its that General Harrison debanks feated the Indians in 1811.

Tipperah, a dist. of Bengal, India.

2,120.000.

Tipperary, an inland co. in the prov. of Munster, Ireland, bounded by Gal-way and King's co. in the N., Cork and Waterford to the S., Qucen's co. and Wateriord to the S., Queen's co. and Kilkenny to the E., and Clare and Limerick on the W. To the N. and W. lies a mountainous region with Keeper Hill (2278 ft.), and in the S. are the Galtee Mts., with Galtymore (3015 ft.), the Knockmealdown Mts., and further F.

The Bog of while in the vale, one of the most fertile regions in all Ireland. The principal rivers are the Shannon in the N.W. with Little Brosna and Nenagh, the Suir and the Nore in the centre and S. Lough Derg is the only lake of any size. Agriculture is the chief industry, barley and oats are the main crops, potatoes and turnips also being grown; a considerable area is under pasture, and cattle are reared in large numbers. Dairy farming flourishes, and there are a number of butter factories. There are also flour and meal mills. Coal, copper, lead, and zinc are found, also slate and limestone, but mining is very little carried on. The county is divided into a N. and S. riding, and comprises twelve baronies; it returns four members to Parliament. There are interesting Parliament. There are interesting remains of castles and ecclesiastical buildings in various parts of the county, notably at Cashel where there is a round tower, at Ardfinnan, at Athassel (an Augustinian priory), at Holycross (Cistercian abbey), and at Felhard and Roscrea (abbeys). The county was one of those supposed to have been made by King John in 1210. It was granted to the earls of Ormonde in 1328, and was the last of Irish palatine counties. county town is Clonmel (10,167), county town is Clonmei (10,167), other towns are Tipperary, Carrick-on-Suir, Nenagh. Thurles, and Cashel. The area is 1659 sq. m. Pop. (1911) 151,951, decreasing through emigration. 2. A market tn., co. Tipperary, Ireland, 23 m. S.E. of Limerick, at the foot of the Tipperary Hills. It is famous for its butter making and famous for its butter making, and there is also a condensed milk factory. Not far from the town is the Glen of Aherlow, and just outside the town is Mew Tipperary, the village built by Mr. William O'Brien in 1890, for the Smith-Barry tenants who had to give up their holdings on account of the boycott. Pop. (1911) 6200.

Tippermuir, or Tibbermore, a par. m. W. of Perth, Scotland, famous for its battle in 1644, in which Mon-trose defeated the Covenanters.

Tippling Act. The Sale of Spirits for peace.

Area 2499 sq. m. It exports large Act, 1750, prohibited any one from quantities of rice. Cap. Comilla. Pop. suing on a claim for spirits supplied siling on a calm for spirits suppose unless the debt were to the amount of 20s. at least and was really a bond fide incurred at one time. The Tippling Act of 1862 repealed the above provision so far as it related to spirits sold or to be consumed elsewhere than on the premises where sold, and de-livered at the purchaser's residence in quantities not less at any one time than a reputed quart.

Tippoo Sahib, see TIPU. Tippoo Tib (Hamed ben Mohammed), a slave-trader in equatorial Africa, rendered aid to Cameron in 1874, and Stanley in 1876. He also took part in the Emin relief expedition in 1887, and became governor of the Stanley Falls district for the

Congo State. Tipstaff, an officer of the Supreme Court, whose duty it is to arrest and convey to prison persons committed by that court who are at the time

actually present therein.

Tipton, a tn. of Staffordshire, 11 m. N.E. of Dudley. It is engaged in coal

mining and the manuf. of heavy iron ware. Pop. (1911) 31,763. Tipu, or Tippoo Sahib (1749-99), son

of Hyder Ali, succeeded his father as sultan of Mysore in 1782. He had suitan of Mysors in 1782. He find previously distinguished himself in the Mahratta War. 1775-79, and in the first Mysoro War had defeated Braithwaite, 1782. As sultan he concluded a treaty with the British in 1784, but in spite of this invaded (1789) the protected state of Travancore. War followed, and in 1792 he was obliged to resign half of his dominions. But nothing daunted he dominions. But nothing daunted he continued his intrigues, urging the French to stir up war with England, the result of which was the storming of his capital, Seringapatam, by the English, during which T. himself was killed.

Tipulidæ, see CRANE FLY. Tiraboschi, Girolamo (1731-94), an Italian historian, born at Bergamo. He was a member of the order of Jesuits, and became professor of rhetoric in the University of Milan, 1755. Here he wrote, Vetera Humilia-torum Monumenta, 1766, but being appointed in 1770 librarian to the appointed in 1770 intrarian to the Duke of Modena, he completed his masterplece, Storia della Letteratura Italiana, 1772-82.

Tirah Campaign, a war which took place on the Indian frontier, 1897-98. It was undertaken by General Sir William I Colchett accident the 44-32-

William Lockhart against the Afridis and Orakzais, who waged a perpetual guerrilla warfare, avoiding general engagements, and after losing many walled and fortified hamlets in the Tirah district opened negotiations

Pop. 6600.

Tiraspol, a tn. in the gov. of Kherson, Russia, on the Dniester, 65 m. N.W. of Odessa. It manufs. flour. Pop. 30,000.

Tiree, see TYREE.

Tireh, a tn. of Asia Minor, 25 m. S.E. of Smyrna. It manufs. cotton goods. Pop. 14,000.

Tiresias, a blind Theban seer of Greek mythology. The story goes that he was deprived of his sight by Athena whom he saw bathing, but was afterwards endowed by her, in pity, with wonderful gifts of prophecy. He was consulted by Œdipus and Creon, and Odysseus descended into Hades to ask his advice.

Tirhut, originally a dist. of Bengal. In 1875, however, it was divided into the two districts of Muzaffarpur and Darbhangah, new divisions being included in 1908. Area 12,600 sq. m.

Pop. 9,700,000.

Tiridates, the name of a dynasty of Parthian or Armenian kings, five of whom are remembered in history. The two most important are Tiridates I. and II. Tiridates I. conquered his kingdom with the assistance of his brother, Vologesius. But Corlulon, from whom he had taken it, forced him to turn to Nero for assistance, whose suzerainty and paramount authority Tiridates was compelled to acknowledge. Tiridates II., who was the son of Kosron, was educated at Rome, and won the friendship of the Romans by his military qualities. At the request of Licinius, Diocletian restored him to the throne of Ar-menia in 286. He was welcomed with enthusiasm by his people, anxious to be freed from the yoke of the Persians. Fortune, however, did not favour Tiridates long, for the Persians soon robbed him again of some of his richest provinces. In 296, however, the Romans replaced him on his He embraced the Christian throne. faith before his death in 314.

Tirlemont, a tn. in Brabant, Belgium, 25 m. E. of Brussels. The chief goods manufs, are woollen and

machinery. Pop. 19,100.

Tiro, Marcus Tullius (c. 94 B.C.-5 A.D.), was the freedman of Cicero, to whom he acted as secretary. He was a man of highly cultivated intellect, and is said to have invented the art of shorthand as practised by the Romans. After the death of Cicero he lived in retirement on his farm in Putcoli.

Tirana, a com. in the vilayet of Scutari, Albania, 54 m. S.E. of the city of Scutari. It is noted for its mosques. Pop. 12,500.

Tirano, a com. in the prov. of Alcala de Hénarès.

Tirano, a com. in the prov. of Sondrio, Lombardy, Italy, 15 m. E.N.E. of Sondrio, on the Adda. order to take up the life of a drama-tist. Molina, or Tellez, as he is more generally known, was very pro-lific, and wrote no fewer than three hundred comedies, which, taking into consideration the length of his creative period, works out at the rate of two plays a month. Tellez ended his life as a member of a religious order. He became prior of the monastery of Soria, where he died at the age of sixtyeight. Among his best known plays are Don Juan, to which Molière was indebted.

Tirupati, a tn. of Madras, India, in the dist. of N. Arcot, 72 m. N.W. of Madras. It is celebrated as a place of pilgrimage, and has a wonderful pagoda. Pop. 15,000.

pagoda. Pop. 15,000.

Tiruvannamalai, a tn. of British India, 50 m. S. of Vellore. It is an entrepôt of trade, and its annual festival in November is the largest in the district. Pop. 17,000.

Tiryns, an ancient tn. in Argolis, is said to have been founded by Proctus, who built the massive walls of the city with the help of the Cyclopes. Proctus was succeeded by Perseus and it was here that Hercules Perseus, and it was here that Hercules was brought up. The remains of the city are some of the most interesting in all Grecce. See Gardner, New Chapters in Greek History, ch. iv.

Tischbein, Johann Heinrich (1722-89), a German painter, the son of a baker, was born at Gotha. Through the help of Count Stadion, he was enabled to study in Paris for five years and afterwards in Italy. He years and atterwards in Italy. He became cabinet painter to the Landgrave of Cassel (1752), and director of the academy of Cassel. He excelled in historical and mythological subjects, his chief works being 'The Transfiguration,' 'Life of Cleopatra,' and 'Death of Alcestis.'

Tischbein Lobern Heinrich Wilstein and State of Alcestis.'

Tischbein, Johann Heinrich Wilhelm (1751-1829), a nephew of the above, was also a painter of some note. His principal paintings are 'Conradin of Suabia,' 'Ajax and Cassandra,' and 'Hector taking leave of Andromache.' He published a work on animals and another on Homer,

illustrated with his own plates. Tischendorf, Lobegott Friedrich Konstantin von (1815-74), a German biblical scholar, born at Lengenfeld in Saxony. He made a special study of N. T. criticism at the University of Leipzig, and in 1845 became professor there. He made frequent journeys, notably in 1844, 1853, and 1859, in search of the best and most ancient MSS. of the N. T., and dis-

covered the 4th - century Sinaitic Codex at the monastery on Mt. Sinai. His works include: editions of the His works include: equious of the Sinaitic Codex, 1862-63; Editio VIII. of the New Testament. 1864-72; an the Sontragint: the edition of the Septuagint; the Monumenta Sacra Inedita, 1846-71; and Reise in den Orient, 1846; Aus dem Heiligen Lande, 1862, which describe his journeys.

Tissaphernes, a Persian soldier and statesman, the son of Hydarnes. He was satrap of Lower Asia in 414 B.C., and during the Peloponnesian War espoused the cause of Sparta though without giving any assistance. His plans being thwarted by Cyrus, who helped the Spartans, he repaired to the king Artaxerxes II., warning him against his brother, and took part in the battle of Cunaxa. He harassed the retreat of the 10,000, after which he resumed his old position general-in-chief and satrap of Lydia and Caria. He then stirred up war with Sparta, but was beaten by Agesilaus near Sardis in 395.

Tisserand, François Felix (1845-96), a French astronomer and author of Trailé de mécanique celeste. In 1892 T. was appointed director of the Paris Observatory. His Lecons sur la détermination des orbites was published in 1899; his Sur les déplace-

celeste is his most important work

Tissot, James Joseph Jacques (1836-1902), a French painter, remembered for his illustrations to the Bible. T. passed some considerable portion of his life in England, and did illustra-tions for some London journals. He made his name in this country as an illustrator of the Bible and of minor religious works. See his Sainte-Bible: Quatre cents compositions par J. J. Tissot.

Tissot, Simon Andrew (1728-97), a Tissot, Simon Andrew (1728-97), a Swiss physician, born at Grancy, but ultimately went to Lausanne where he became famous as a physician. He wrote L'Onanisme, 1760; Avis au peuple sur la santé, 1761; Traité de l'épilepsie, 1772; Traité des nerfs et de leurs maladies, 1782; L'Inoculation instifiée 1754. tion justifice. 1754.

Tissue, in biology, a structure made up of cells and fibres entering into the organisation of a plant or animal. Connective tissues are those which connective ussues are those which serve to support the specialised portion of any organ; they are classified as adipose, or fatty T., areolar T., ossems, or bony T., cartilaginous T., clastic T., fibrous T., limphoid T., etc. Tista, a river of India, flowing through Sikkim and Bengal into the Decharactura. It rises in Tibut

It rises in Tibet. Brahmaputra. Length 200 m.

Tisza, Koloman (1830 - 1902), a Hungarian statesman, born at Geszt. Hungarian statesman, born at Geszt. He was elected to the Diet in 1861, and became leader of the more Radical party in the house, and when owing to his influence a new party had been formed out of Deak's followers, the Syabadelvii Party, or Free Principles Party, he became prime minister. It was mainly owing to T that Austria remained neutral to T. that Austria remained neutral during the Franco-German War, and

during the Franco-German war, and Hungary owes to him, besides many reforms, a consolidated government. Tit, or Titmouse, names given to members of the passerine family Paridæ. Five species, all great insecteaters, are common in Britain, and two occur in a few districts; one of these is the bearded T. or reed these for the passerine family which pheasant (Panurus biarmicus), which is found only in Norfolk and Yorkshire. The male is about 6 in. long, snire. The male is about 6 in. long, and has a thin tuit of black feathers on each side of the chin; the general colour is light red. The crested T. (Parus cristatus) occurs only in parts of Scotland, though it sometimes visits England. The blue T. (P. caruleus) is the commonest of these birds; its prevailing colour is these birds; its prevailing colour is blue, with green above, and a black throat. The cole T. (P. a/cr) has a black head. with a white patch on the nape. The great T. (P. major) is about 6 in. long and is yellow on the back, breast, and sides, with grey wings and tail, and black head and throat. The march T. (P. palustris) resembles the colo T. except for the latter's white nape and white spots on the wings. The long-tailed T. (Acredula caudata) is about 51 in. long, and has the black tail feathers prolonged and graduated.

Titan, the largest of Saturn's satellites, discovered by Huyghens, 1655. It revolves round its primary in about 15 days 223 hours at a distance of 771,000 m. Its diameter is probably 3000 to 4000 m., its mass Toos that of Saturn. It appears as the star of the ninth magnitude.

Titanes, the sons and daughters of Uranus (Heaven) and Go (Earth). They were twelve in number, six sons and six daughters. It is said that Uranus, the first ruler of the world, threw his sons into Tartarus. indignant at this, pursuaded the Titans to rise against their father. The Titans then deposed Uranus, liberated their brothers who had been cast into Tartarus, and raised Cronus to the throne. It having been for-teld to him by Gra and Uranus, that he should be dethroned by one of his own children, he swallowed his children successively. Rhea, therefore, went to Crete, and gave birth to Zeus in the Dictean Cave. When Zeus had grown up he availed himself of

bring up the stone and the children brothers and sisters, Zeus now began ten years, till at length Gea pro-mised victory to Zeus if he would deliver the Cyclopes and Hecaton-cheires from Tartarus. Zeus accordingly slew Campe, who guarded the Cyclopes, and the latter furnished him with thunder and lightning.

Titania, see MAE, QUEEN.
Titanic Disaster was caused by the luge White Star liner Titanic colliding with an iceberg on the night of April 14, 1912. In all, close on 1500 persons were drowned, among the more well known being Colonel J. J. Astor, Mr. Jacques Futrelle, the American novelist and dramatist, Mr. F. D. Millet, the artist, Mr. William T. Stead, and Mr. Harry Wildener, millionaire book-collector. Out of 2201 passengers, only 711 were saved. The T., which was then the largest boat on record. was on its maiden voyage to New York, shortly before midand night of the third day of the trip, when in lat. 41° 26′ N., and long. 50° W., struck an enormous iceberg a glancing blow stripping off her bilge practically from end to end. Such life-boats as were on board were lowered in a calm sea and wholly or partly filled with passengers, the majority being women. Less than three hours from the impact the liner sank. The 711 survivors were picked up some hours later by the Carpalhia, with whom the T. had got into wireless communication.

The Mersey Report of the Royal Commission appointed by the British Government finds that (1) the ship was travelling at an excessive speed; (2) the captain was not negli-gent, but extra look-outs for ice should have been kept; (3) the lifeboard.

the assistance of Thetis, who gave to lysis of a solution of the oxide in cal-Cronus a potion which caused him to cium chloride. T. unites directly with nitrogen to form a nitride having he had swallowed. United with his a metallic lustre. Like silicon dioxide, T. dioxide is the anhydride of the contest against Cronus and the a weak acid, but it also exhibits ruling Titans. This contest lasted feebly basic properties. In its haloten years, till at length Gea progen compounds T. is tetravalent and

hexavalent. Tithe. Ts. were 'the tenth part of the increase yearly arising from the profits of lands, stocks upon lands, and the industry of the parishioners, payable for the maintenance of the parish Titans were then overcome, and hurled down into a cavity below Tartarus.

Titania, see Mar, Queen.

Titanic Disaster was caused by the stiffer of the Law of England). Ts. having long ago become commuted for a rent charge, the law of T. is of little practical importance. Ts. were payable before the Christian era (see Gen. xiv. 20), but in the Christian Church Ts. were first given by the faithful as spontaneous offerings, at the urgent solicitations of the clergy (Clarke's Hist. of Tithes). Such voluntary offerings were given in kind, most giving wool, corn, or other agricultural or farm produce. Canon law (q.v.) later enjoined payment as a legal obligation in accordance with the divine law of the O.T. (sec TEINDS). Ts. were either prædial, personal, or mixed: prædial being the produce of the soil (e.g corn, wood); personal, the produce of labour and industry; and mixed, the produce of animals, including eggs (Eagle, On Tithes). Personal Ts. rested on custom only, but every man had to pay the other kinds. Prior to the decrees of the Lateran Council (1215), it was a common practice to pay T. to monasteries, but the Council restricted tithe-payers to payment to the parsons of parishes (Clarke). Hence most Ts. belonged as of common right to the parish incumbents. though sometimes laymen could show a right to a portion of Ts., based upon a prior voluntary grant to some spiritual corporation. Again, rectorial Ts., after the dissolution of the should have been kept; (3) the lifeboat accommodation was altogether indaequate; in which respect, however, the T. complied with the regulations of the Board of Trade and the
provisions of the Merchant Shipping; glebe, old monastic lands held prior
Act for the safety of passenger to the dissolution exempt from Ts.,

steemers: and (4) another steamer crown lands or lands held by a
spiritual corporation which has never saw the lights of the T. and could spiritual corporation which has never have pushed her way through the been known to pay Ts., and lands in ice and rescued most of those left on respect of which a modus or composition real was payable (Millard's Titanium (Ti, 48'1), a metal of the Tithe Rentcharge). (A modus was an agreement between tin group and occurs in nature as the agreement between parson ordinary ordinary land and landowners and patron, whereby correction whereby correction was the landowners agreed to pay a perfect Themselative, cancillation of perfect the gr. 3-5), and is obtained by the electro-Commutation Act, 1836, and amend-

The name and division of T. itself still remains in parts of the country.

2. Levying a tax on or to the amount of a tenth. TITHE.

Tithonus ($T\iota\theta\omega\nu\delta$ s), in Greek mythology, was the son of Laomedon and brother of Priam. He was beloved on account of his beauty by Eos, who besought Zeus to bestow upon him immortality. This was granted, but as Eos forgot to ask for perpetual youth he became a hideous old man. As he could not die Eos changed

him into a grasshopper.

Titian, or Tiziano Vecelli (c. 1477-1576), the greatest painter of the Venetian school, born at Pieve, in Cadore, a mountainous district of the Venetian Alps. Having shown a taste for art, he was sent to Venice to learn painting, and first studied under Zuccati, a mosaicist, afterwards becoming the pupil of Bellini and Giorgione. Heseemsfirst to have been employed in the decoration of houses, but he also produced works on canvas, notably the allegorical picture 'Sacred and Profane Love,' 'Doge Marcello' (at the Vatican), and 'Christ and the Pharisee,' 'Tribute Money,' of the Dresden Gallery, spoken of by Vasari as something stupendous and miraculous. In 1516 he went to Ferrara, and executed amongst others the 'Bacexecuted amongst others the 'Bacchus and Ariadne,' now in the National Gallery. In 1533 he became acquainted with the Emperor Charles V., who sat to T. for his portrait, rewarding him by making him a Count Palatine and a Knight of the Golden Spur. Returning from Bologna to Venice (1537), he executed his magnificent 'Battle of Cadore,' which unfortunately perished by fire in 1577, but he was again with the emuniorunately perished by fire in 1577, but he was again with the emperor at Milan in 1541, and in 1545 accepted the pope's invitation to Rome, where he painted portraits as well as 'Dane,' now in the Naples Museum. In 1548 he undertook a journey across the Alps to join Charles V at Aughurg and painted journey across the Alps to join Charles V. at Augsburg, and painted the well-known portraits of Philip of the well-known portraits of Philip of Spain. From this time he was chiefly occupied in working at Venice, until in 1576 he died of the plague. T's reaction is complete as shown by works are remarkable for their magnificent colouring and technical skill. as litmus, methyl orange, phenol-

Tithing

Trentcharge nount of the rentcharge for which the Ts. of each parish were to be commuted.

Tithing: 1. In Anglo-Saxon police arrangements, associations of ten men (in the N. of England called the tenmannetale; elsewhere frithborh or frankpledge) who, dwelling near each other, were sureties or free pledges to other, were sureties or free pledges to other the painted religious pictures as well as mythological, poetical, and allergorical subjects, and as a portrait painter he occupies the first rank. Among his numerous works are: 'Holy Family and St. Catherine,' Noli me Tangere,' Venus and Adonis' (all of which are in the Mannetale; elsewhere frithborh or frankpledge) who, dwelling near each other, were sureties or free pledges to other were sureties or free pledges to other works. rara and Laura Dianti (Louvro), the Pesaro altar-piece (at Antwerp), 'The Three Ages,' 'Titian and his Mistress,' 'The Repose in Egypt,' 'Martyrdom of St. Lawrence,' 'St. Peter Martyr' (1530, destroyed by fire at Venice, 1567), 'Assumption of the Madonna,' and 'Eutombment of Christ' (Louvre).

Titices Lake a wonderful moun-

Christ (Louvre).
Titicaca. Lake, a wonderful mountain lake in the Andes, on the frontier between Bolivia and Peru, in S. America. It is 120 m. long, and lies 12.545 ft. above the sca. Its area is 3200 sq. m., and its maximum depth is about 700 ft. The water is fresh but unpleasant. Coal has recently been found in the yicinity. cently been found in the vicinity. This lake is bound up with the origins of the Peruvian civilisation.

Titiens (or Tietjens), Theresa (1834-77), a Hungarian singer, created a veritable sensation on her first appearance in London (1858), when she played Valentine in Les Hunuenots, and henceforward made this country her home. Gifted with an inexpressibly fine soprano voice and uncommon dramatic force, she was supreme in oratorio no less than opera.

Tit-lark, see Pipir.
Title Deeds, deeds that establish a person's right or title to lauds. The possession of the T. D. relating to any particular piece of land is of the first importance since present the property of the first threating since present a see the latter of the first threating since present and the first threating since present seems. importance, since no one can validly sell or mortgage the land who has not got the deeds, though he may well mortgage the equity of redemption. Titles, the additions to a person's name, indicative of some honour,

office, or dignity, e.g. emperor, prince, chancellor, primate, duke, mayor. Some T. are held virtute officio, as for instance 'king'; others like the T. of the five orders of nobility in Britain, are hereditary, and some, like that of knight, are conferred for life

only. Titmouse, see Tit.

Titration, a method in quantitative chemical analysis. The amount of a substance in a definite quantity of solution is determined by causing it to react with a solution of another re-

calculated. Titular, that which exists in name or title only, as a T. king or T. bishop.
A T. bishop in the Roman Catholic Church is one who derives title from an extinct see. In ecclesiastical law, generally a T. is an incumbent (q.v.) who enjoys his benefice without performing the duties appertaining to it. In Scots law Ts. of teinds are those laymen to whom teinds (q.v.) have

been granted by the Crown.
Titus, a friend and companion of St. Paul, not named in the Acts. All we know of him is learned from the letters of the Apostle. He was left by the latter as Bishop of Crete, and there he received the epistle which bears his name. Eusebius says that he remained unmarried and finally

died in old age.

(T. Flavius Sabinus Titus pasianus) (40-81 A.D.), a Roman general, son of Vespasian. Roman emperor (79-81 A.D.). He won distinction early as military tribune in Britain and Germany, and helped to crush a Jewish insurrection (67), besleging and storming Jerusalem (69-70). T. was associated with Vespasian in the government (71), and succeeded him (79), proving a wise and kind ruler. See Suctonius, Titus; Tacitus, Hist.; Josephus, Hist. of the Jewish War; Tillemont, Hist. des Empereurs: Jung, Dissertatio, 1761; Rolland, Vespasian et Titus, 1830; Stange, De Tüi Vila, 1870; Beulé, Titus et sa Dynastie, 1872.

Titusville, a city of Crawford co., Pennsylvania, U.S.A., 18 m. N. of Oil City. It is the centre of the oil interest, and has iron works and engine works. Pop. (1910) 8533.

Tityus (Tirvos), a giant of Eubea, son of Gea, or of Zeus and Elara. For offering violence to Artemis (or in other accounts to Leto) he was killed! by Zeus or Apollo and then cast into Tartarus, where two vultures per-petually devoured his liver as he lay outstretched on the ground. See Odyssey, xi.: Lucretius, De Rerum Natura, iii.; Virgil, Æn. vi. 595.
Tiumen, or Tyumen, a tn. in the gov. of Tobolsk, Siberia, 125 m. S.W.

phthalen, or by cessation of efferve-transfer. 18 m. E.N.E. of Rome, on the scence. The quantity used is noted Teverone (ancient Anio), in Italy, and the weight of reagent contained Before Rome was built the Latin is thus known. From the chemical city of Tibur flourished. In Horace's equation and the atomic weights, the amount of the other salt can then be resort of wealthy Romans, and ruins of Hodrin's and Macanau' riles of Hadrian's and Mæcenas' villas, besides mausolea, aqueducts, and a circular temple are still shown. Apart from classical remains the Renaissance garden of the Villa d'Este (begun in 1549) excites much interest. Pop. 12,000.

Tixtla, or Tixtla de Guerrero, a tn. in the state of Guerrero, Mexico, 4 m. N.E. of Chilpancingo. It was origin-

ally the capital. Pop. 6500.

Tizi-Ouzon, a com. of Algeria, 53 m. E.S.E. of Algiers. It produces large quantities of fruit, and was formerly a Roman station. Pop. 29,000.

Tlaxcala, an inland state of Mexico and its capital. The state, which has an area of 1595 sq. m., lies on the Mexican plateau, average height 7000 ft., rising in Malinche to 7000 ft., rising in Malinche to 14,636 ft. In the days of the great Aztec empire, T. proved a New World Switzerland, and maintained a sturdy independence within her mountain fastnesses till, in 1519, she became the ally of the Spaniards under Cortes. The capital lies 18 m. N. of Puebla. Pop. 2812.

Tlemcen, a tn. in the dept. of Oran, Algeria, 85 m. S.W. of Oran. It has a number of interesting buildings, among them being synazogues, mosques, and a museum of anti-quities. It exports ostrich feathers and cork, and manufs. cotton and Rashgun is its port.

woollen goods. Ra Pop. (com.) 40,000.

Tlepolemus (Τληπόλεμος), in Greek mythology, the son of Heracles by Astyoche or by Astyoche He was king of Argos, but fled after slaying his uncle, Licymnius. T. then settled in Rhodes, founding Lindos, Talysos, and Camirus, in accordance with an oracle. In the Trojan War he fought for the Greeks, but was slain by Sarpedon of Lycia. See *Iliad*, ii. 658; v. 627.

Toad, the name usually applied to members of the genus Bufo and of the family Bolonide. They differ from frogs chiefly by the total absence of teeth, the entire tongue which is bifid behind in frogs, and in certain anatomical features, such as the shoulder girdle and the saceal vertebra. of Tobolsk, Siberia, 125 m. S.W.
of Tobolsk, It manufs. carpets and has tanneries. Pop. 27,000.
Tiverton, a municipal bor. of Devonshire, England, on the Exe, appears to be necessary for the poison 13 m. N.N.E. of Exeter. The chief building of interest is the old church through an abrasion or other means of St. Peter. Lace-making is the chief to be noxious. The two British Ts. industry. Pop. (1911) 10,205. are the natterjack (Bufo calamita) and Tivoli (ancient Tibur), an ancient the common T. (Bufo vulgaris), which

is generally distributed over Great included with the Ten Command-Britain, though absent from Ireland, ments. Its revival was largely due It has longer hind limbs than the other and is able to hop. Its eyes are more lateral and the irises reddishcopper colour. The female usually larger than the males. The females are natterjack, which is local in England, cannot hop, as the hind limbs are too short, but it is able to run and is often prominent and the iriese called the running T. greenish-yellow. During the breeding season the males croak very loudly. The value of Ts, to the farmer and gardener cannot be exaggerated as they feed entirely on insects, milli-

pedes, woodlice, slugs, and snails.
Toadflax, or Linaria, a genus of plants and sub-shrubs (order Scrophulariacem), with a spurred corolla A number of species grow wild in Britain, but some of them are not

widely distriplant, which re-

from seed and by means of its long rooting stems. The yellow T. (L. vulgaris) is a handsome and common hedgerow plant, with terminal racemes and large vellow flowers. Several species are grown in gardens.

Toadstool, a popular name for other fungi than the mushroom. See

FUNGI.

Toast (from Lat. tostum, scorched), a piece of bread dried and browned on either side before the fire. But it is also used of the invocation to the guests after dinner to drink to the health of the host, distinguished guests, absent friends, the royal family, the bride and bridegroom, etc., or of a great institution, society, or cause. In the 18th century pretty women were popularly called Ts., because it was the custom to drink

their healths.

Tobacco. The use of T. dates from remote antiquity among the natives of the American continent. It was It was smoked in pipes and as cigars, and the Aztecs used nostril tubes for inhaling The date of the introducthe smoke. tion of T. into Britain has been fixed as 1559, Hernandez de Toledo having imported Mexican plants to Spain. purpose, and it is suggested that the Sir John Hawkins in 1565 first introduced it into England and though holder. Nicotine, the characteristic Sir Wulter Raleigh and Sir Francis alkaloid of T., and of high value as an Drake did much to popularise its use twenty years later, there is good evi-dence that T. was being extensively smoked about 1573. T. smoking met with vigorous opposition, in which King James I. joined, and smokers were cruelly persecuted, smoking being declared a capital ing extract to be used for purely against the process of the control o smoothing being decimined a capital ling extract to be desired for action of flerice in some countries, while in the cultural or horticultural purposes, canton of Berne, its prohibition was (See Board of Agriculture Journal,

to its repute as a disinfectant and its employment as a remedy for various maladies. By

18th century, very heavy, often being encouraged to smoke. The use of snuff displaced the practice of smoking in the Georgian period, but it gradually returned to favour with the reduction of taxation on T. The eigarette habit began with the return of the soldiers from the Crimea. The present popularity of smoking in Britain may be inferred from the fact that in the year 1911-12, the total income in customs and excise duties from T. was nearly £17,500.000, including an excise duty of 3s. 6d. per pound on home-grown T. which realised £10,22s. Though smoking by women is customary in some of the Eastern countries, it is looked upon with disfavour elsewhere. Smoking by children and the sale of T. to them by children and the sale of T. to them is forbidden in many states, including Britain. The chief T. growing districts are N.W. Cuba, the states of Kentucky, Carolina, Ohio, and Virginia, but T. culture is an important industry in Turkey, Mexico, and most parts of the British empire, as well as to an increasing extent in It was grown in Britain in Europe. considerable century, but . hibited under

Charles II.'s the American industry. In 1799 T. growing was again permitted in Irc-land, and by 1829 500 acres were under cultivation, chiefly in Wexford. but two years afterwards was again nut two years afterwards was again 1898, and in 1904 the cultivation of 100 acres was authorised with the rebate of 1s. per pound, afterwards reduced to 2d. Within a few years it was possible to say that the industry was commercially sound and experienced work has also hear understanced work and hear understanced work and hear understanced with the result was a second work and hear understanced with the result was possible to say that the industrial was a second work and hear understanced with the result was a second work and hear understanced with the result was possible to say that the industrial was a second work and hear understanced with the result was possible to say that the industrial was a second work and hear understanced with the result was possible to say that the industrial was a second work and hear understanced with the result was possible to say that the industrial was a second work and was a second perimental work has also been undertaken in England with satisfactory results. Major G. F. Whitmore, in Norfolk, has shown that the crop is suitable for poor sandy soils which are practically worthless for any other purpose, and it is suggested that the in

March 1913.) T. seedlings are planted out in May. The plants are topped and buds and shoots removed so that each bears about a dozen large These are harvested in September, and are dried in specially constructed barns in a temperature of about 75°. Afterwards they are sweated in covered heaps from six to eight weeks and are then fermented and dried. T. was formerly much adulterated with a large variety of substances, but the supervision is now so strict that it is practically imnossible.

Tobacco poisoning is due to longcontinued over-indulgence, and affects not only the heart and nervous system, but also the digestion. The best treatment is a general tonic, and an entire abstention from T. for some weeks, when the symptoms will usually all disappear. Excessive smoking almost invariably undermines the

constitution sooner or later.

The analysis of T. shows its ingredients to be: (1) A tobacco camphor called nicotianin, which crystallises and is solid at the ordinary temperature of the air; (2) nicotina, an alka-loid which, like conia, does not exist in d form, having

The empyreumatic oil of T. appears to be formed during the destructive combustion, and does not exist naturally in the leaf, but is probably formed at the expense of the nicotina. It does not therefore exist in the infusion of T., the mode of action of which differs in several respects from the other forms in which it is employed. The products of T. when burnt, as in smoking, are carbonate of ammonia, nicotianin, empyreumatic oil, soot, and some gases.

Tobogganing (from an Indian word, tobaakan, meaning sledge), the practice of sliding down natural or artifiners. The American clipper-sled is about 13 in. wide and is fitted with 'double-runner'; it is usually steered by turning the front runners by means of a wheel or ropes. The course from Klosters to Davos is nearly 2 m. long and has a drop of 800 ft.; on it are contested the International and Symond's Cup races.

Tobago, an island of the British W. creasing). Indies, 22 m. N.E. of Trinidad. The Toboso, chief products are sugar, cotton, 60 m. S.E. of Toledo; famous in tobacco, cocoa, and rubber. It was Don Quirote, discovered in 1498 and became the

are property of Britain in 1763. Chief town, Scarborough. Area 114 sq. m. Pop. 20,000.

Tobas, The, a tribe of S. American aborigines who dwell between the Vermejo and Pilcomayo rivers. They are remarkable for their well-developed chests, their short limbs, and their European aspect. They belong to the Guaranian stock, and are much more savage than the Chiquitos.

Tobermory, a vil. on Tobermory Bay in N.E. Mull, Argyllshire, Scotland. Steamers ply regularly to the Clyde and to Oban, Skye, and Lewis.

Pop. (1911) 997.

Tobin, John (1770-1804), an English dramatist, was a solicitor by day and a playwright by night. For fifteen years he persevered in writing comedies like The School for Authors and romantic dramas. Finally he offered The Honey Moon, a somewhat lifeless imitation of a Shakespearean play, to the Drury Lane management. Its performance was a huge success.

Tobit, Book of, one of the books of the Apocrypha, which, however, was included in the Alexandrian canon of the O.T. It is a Haggadic romance based on an old tradition, embodying in historical form a series of moral and

in historical form a series of moral and religious lessons. Its date is given by Ewald as about 350 B.C., but Hitzig places it in the reign of Trajan.

Tobol, a trib. (425 m. long) of the Russian Irtish, which it joins near Tobolsk. It rises in the S. Urals.

Tobolsk, a gov. and its can. in Western Siberia: 1. The gov. which has an area of 535,739 sq. m., stretches from Semipalatinsk in the S. to the Arctie Ocean in the N. It is separated from European Russia by the Norfrom European Russia by the Northern Urals, but otherwise is low-land. It is drained by the ramifications of the Ob (1300 m.) and its tributaries, the Irtish and Tobol, etc. The climate cial slopes of snow or ice on a sled is bleak and inhospitable. Far away cial slopes of snow or ice on a sical is obeas and innospicate. It is having a curved-up front, and usulative furnished with iron or steel runtum tundras, whilst in contrast with the ners. The American clipper-sled is fertile Tobol and Ishim steppe are about 13 in. wide and is fitted with the districts of Tura, Tara, and about 13 in, wide and is fitted with the treacherous round steel runners; the rider lies flat Tobolsk, where the treacherous upon it, face downwards, and steers urmans (quarmires) are interspersed it with his toe. Two such sleds fas-among pathless forests (taiga). The treather form a bob-sleigh or cultivation of cereals is of the first but cattle-breeding is importance, but cattle-breeding also carried on. Pop. (1911) 1,842,400. 2. The tn. is a well-built city on the Irtish, near its junction with the Tobol, 305 m. E.N.E. of Ekaterinburg. It was once the capital of W. Siberia. Pop. (1910) 20,292 (de-

the prov. of Borca, Tripoli, 220 m. E. Version of the Bible (1834), and some of Benghazi. It has an excellent theological treatises. harbour.

Tocantins, a riv. of Brazil, rising in the state of Goyaz and flowing N. into Its largest trib. is the Araguaya. Its course, which is much interrupted by rapids, is only only navigable in some parts. Length 1500 m.

Toccata, in music, an instrumental composition. It is intended to exhibit brilliance of touch and execution, as the name, from Italian tocrare to touch, indicates, A succession of notes of equal length give it a flowing movement, the whole having

air of a showy improvisation.
Tocque, Louis le (1696-1772), a
French painter, born at Paris. He
became a member of the French Academy in 1734, and subsequently worked at St. Petersburg and Copenhagen, but he returned to Paris ere his death. The Louvre has some of his best pictures, while others are in the museums of Amicus and

Nantes. Toqueville, Charles Alexis Henri Maurice Clérel de (1805-59), a French historian, accompanied Gustave de Beaumont to America to study prisons in 1831, and took the opportunity to collect materials for his De la Démocratie en Amérique (1835), u work of peculiar interest as the first reasoned and more or less unbiassed exposition of popular government in that country. An orthodox Liberal in politics, he was elected vice-president of the Assembly in 1849, was dis-appointed when Louis Napoleon became emperor, and met with an enthusiastic reception from Stuart Mill and other great Whigs, when he visited England. He published Ancien Régime et la Révolution,

1856. Tod, James (1782-1835), an English ames (1702-1005), an enginent lieutenant-colonel and author, was appointed political agent in 1817 for the states of Western Rajputana, India, and took every advantage of the facilities his position gave him to collect information about the history, geography, and antiquities of that country, the result of his research being the Annals of Rajashan (1829-32).

Todas, The, a pastoral tribe dwelling in isolated hamlets ('mand') on the slopes of the Nilgiri Hills, India, in what is a kind of 'tropical Switzer-

Toddy, a word used for the drink of hot whisky and sugar flavoured with lemon. It also applies to the the Atlantic Ocean through the Rio juice of palms from which arrack is

Todea, a genus of evergreen ferns with fine or coarsely divided dark green fronds, some of which are semi-transparent. T. barbara is able to survive a dry atmosphere.

Todhunter, Isaac (1820-84), an English mathematician; graduate of London and Cambridge. At St. John's College he was a scholar, fellow, and lecturer in turn, heading the degree list as senior wrangler, and gaining the mathematical blue ribband, Smith's Prize. He was a member of the council of the Royal Society. His text-books on algebra, trigonometry, and calculus, are well known in the schools.

Todi, a tn. in the prov. of Perugia, Italy, 24 m. S. of Perugia, There are remains from the time of the Romans and Etruscans, and a Renaissance church, Santa Maria della Consola-zione, Pop. 16,600.

Tödi, a height of the Swiss Alps situated on the borders of the cantons of Glarus and Grisons. Height 11,887 ft. Todi, Jacopone da, sce JACOPONE

DA TODI.
Todleben, Franz Eduard Ivanovich, Count (1818-84), Russian general and engineer, born at Mittau in Courland. He entered the Russian army as an engineer in 1836; served against Schamyl in the Caucasus (1848); in Schamyl in the (1953) and in the

he constructed nastopol (1855). War he success.

(1877). See his of Schastopol, 1864-72; also Brialmont's Life in Todnorder

Todmorden, a municipal bor, in the W. Riding of Yorkshire, England, 19 m. N.N.E. of Manchester. It has cotton weaving and spinning factories, foundries, and machine shops. Pop. (1911) 25,455.

(1911) 25,455.

Tofana, see AQUA TOFANA.

Toga, the principal outer garment of the ancient Romans, made of woollen material, usually white. It was a large semicircular piece of cloth, the straight side 4 or 5 yds. long, the width about 2 yds. It was worn with half the straight side hanging over the left shoulder in front, the other half brought round under Todd, Henry John (1763-1845), an English author, became archdeacon of Cleveland in 1832. He wrote lives of Brian Walton, Bishop of Chester, purple border. At the age of seven-(1821), and of Cranmer (1831), besides an Authentic Account of our Authorised broidered) was worn by generals in age annual production is 5,000,000 their triumph. The emperors were a gallons, which is nearly all bought purple toga. Mourners and persons up within the country. Pop. 5100. impeached wore a 'toga pulla' of a dark colour, while those seeking office wore a bright one, hence name 'candi-The garment was not allowed to be worn by foreigners or slaves.

Toggenburg, the upper valley of the R. Thur, canton of St. Gall, Switzerland. It extends for about 30 m., and is enclosed on the N.E. by the chain of the Säntis (8216 ft.). and on the S.W. by the Kurfürsten (7576 ft.). The chief villages are Lichtensteig, Kirchberg, and Wattwill.

Togo, Count Heihachiro (b. 1846),

Japanese admiral and member of the Supreme Military and Naval Council, born in Kagoshima. From 1871-78 he studied in England at the Thames Naval College, Greenwich, and on the Worcester. He had already entered the Japanese navy and seen some service. He was made admiral in 1904, and acted during the Russo-Japanese war as commander-in-chief of the Combined Fleet. His exploits during this war were numerous, the chief being the bombardment of Port Arthur. He was present at the coronation of George V.

Togoland, has been a German colony since 1884. It is on the Gulf of Guinea, W. Africa, and is bounded on the N. by Upper Senegal and Niger (French), on the E. by Dahomey, on the S. by the Atlantic, and westward by the British Gold Coast territory. A chain of highlands runs from S.W. to N.E., the highest point being Mt. Atilakuse (3248 ft.). Togo lagoon receives the rivers Sio and Haho, and other streams are the Oti, Volta, and Mono. The climate is unhealthy, and only 363 Europeans live here (1910). Palm kernels, maize, rubber, palmoil, and cotton are exported, and cocoa, tapioca, and bananas, etc., are cultivated on fertile tracts which lie between arid plains whilst draw moods and caoutch The capital,

is connected

Palime, and since 1911 with Atakpa' CII. of -

occupations of the coloured peoples, who number about 1,500,000.

Tokat (ancient Dazimon), the chief tn. of Tokat sanjak, vilayet of Sivas, Asia Minor, 52 m. N.N.W. of Sivas. It manufs, copper-ware and leather. Pop. 30,000.

Tokay, or Tokaj, a tn. of Zemplén co., Hungary, at the confluence of the Bodrog and the Theiss, 148 m. E.N.E. of Budapest. It is famous for its wines. The vine grows on a plateau among the Hegyalia Mts. The aver- man of letters, published in 1696 a.

Tökölyi, Imre, Count (1656-1705), a Hungarian patriot, born at the castle of Késmárk (Zips). He was leader of the insurrection of 1678 against Leopold I., and captured many towns. The Porte declared him Prince of Hungary under Turkish suzerainty in 1682, and in the following year T. joined Kara Mustapha in invading Hungary, but was defeated outside Vienna and taken prisoner (1685) by the Turks for making overtures of peace independently. In 1690 with Turkish aid he won the battle Zernest, and was declared Prince of Zernest, and was declared Prince of Transylvania. After the peace of Karlowitz, the sultan created him Prince of Widdin.

Token (coin: ge), generally defined to mean money current by sufferance and not by authority. In the reign of Elizabeth coins called Ts. were struck by the corporations of Bristol. Oxford, and Worcester, and at a later period, even by private persons. In 1797 5s. Ts. were issued by the Bank of England, and in 1811 3s. and 1s. 6d. Ts., which continued in circulation till 1816. At the present day there is only in England a single or gold standard of money, and though silver and bronze (copper) coins are legal tender (see TENDER) up to a certain amount, they are really subsidiary or T. coins and may be compared to banknotes in that their intrinsic is less than their

nominal value.

Tokyo, or Tokei (' Eastern Capital'), the cap. of Japan, situated on the S.E. side of the island of Hondo or Honshiu in the Bay of Tokyo, on the delta of the Sumida R. Until 1868 it was known as Jedo, Jeddo, or Yedo ('Estuary Gate'), and received its present name when the Mikado removed his court thither from Kyötö. The magnificent palace in Ayoto. The magnineent palace in Japanese-European style, stands in the park Fukiage, not far from the ancient castle. To the E. of the palace lies the commercial and industrial part of the city, while the northern division is mainly educational, containing the Imperial University, which had 5008 strategy and versity, which had 5098 students and 363 professors in 1910-11, the Law School, First Higher Middle School, etc. The port of entry, Yokohama, is 17 m. distant. T. has suffered frequently from fire, so many of the houses being built of wood, as well as from storms, earthquakes, and epidemics. The government buildings had to be rebuilt after the fire of 1891. The town was open to the residence of foreigners in 1869. Pop. 2,186,079.

Toland, John (1670-1722), an Irish

work entitled Christianity not Musterious, which occasioned a controlerious, which occasioned a controleon and Pope Pius VI., and here in orthodox, and was in the following tear, by order of the House of Commons, burnt by the common hang-mon In 1701 he visited Hangwar and isidered the natural vicinit of the man. In 1701 he visited Hanover and sidered the natural right of the Berlin, and four years later published minarity a valuable Account of these courts, in which he gave interesting pen-portraits of the royalties. He wrote a life c of Milton.

Toledo: 1. A prov. of the Tagus is not a unrect offspring of the Reforvalley, Central Spain, 5920 sq. m. in mation, but rather of the humaniarea, formed (1833) from part of New Castlle. It is bounded N. by Avila and Madrid, E. by Cuenca, S. by Ciudad Real, W. by Caceres, and is mountainous in parts. Various minerals are found, but not much worked. Sheep, asses, goats, and fighting bulls are reared, bees and silkworms are also kept. Some texsilkworms are also kept. Some textiles, wine, spirit (aguardiente), oil, and chocolates are manufactured. See H. Lynch, Toledo (Med. Town Series). Pop. 410,277. 2. The cap. of above, on the Tagus, 50 m. S.S.W. of Madrid, and once cap. of all Spain. It has a fine Gothic cathedral (1227-1403), and interesting Mosciele and 1493), and interesting Moorish and Mudejar remains. The great square or 'Zocodover' was once the scene of bull-fights and the burning of The fine old Alcazar was heretics. partially burnt in 1887. Toledan sword-blades were famous in Roman sword-onaces were famous in Roman times, and fine steel cutlery is still manufactured near by. Pop. 24,000. See Ibañez Marin, Recuerdos de Toledo, 1893; Calvert, Toledo, 1907. 3. The cap, and port of entry of Lucas co., Ohio, U.S.A., on Maumee R., at the W. end of Lake Erie, about 92 m. from Cleveland. Manufs. in-clude flour. malt. liquors. lumber. clude flour, malt, liquors, lumber, foundry-products, hides, wool, and tobacco. Its trade is carried on by means of the Great Lakes, canals, and numerous railways. Pop. (1910) 168,497.

Toledo, Don Pedro de (1484-1553), Marquis of Villafrança, and son of the Duke of Alba, born at Alba in Tormes. In 1532 he was appointed vicercy of Naples, where he built the famous Toledo Street. His religious fanati-cism led to a popular revolt. He died at Florence while leading an army against the French in Sienna.

Toledoth Jeshu (Heb. tions of Jesus'), a s

tarian and liberal movements which followed it. Largely also, it is due to religious indifference.

Tolima, a dept. of Colombia. Area 10,900 sq. m. Cap. Ibagué (12,000). The volcano of Tolima rises 18.125 ft., the highest peak in Colombia. Pop. (est.) 200,000.

Tollens, Hendrik Caroluszoon (1780-1856), a Dutch poet, born in Rotter-dam. He attained popularity by celebrating heroic deeds in Dutch history in a series of lyrical romances which possess great vitality and charm. Among his works are the comedies De Bruiloft (1799) and Gierigheid on Baatzucht (1801); the tragedy Konstantijn, and the poems Romanzen, Balladen, en Legenden 1818; Nieuwe Gedichten, 1840; and Laatste Gedichten, 1848-53.

Tolls, a tax imposed in consideration of some privilege. In the feudal system it meant the right to tollage one's villeins. Later it became the distinguishing mark of a turnpike road, i.e. a road having toll-gates or bars on it, called 'turns.' These 'turns' appear to have been first constructed about the middle of the 18th century, when certain interested individuals subscribed among themselves for the repair of various roads, and exacted a T. for the privilege of using the roads so repaired. The popular resistance to these exactions led to the passing of Acts to regulate T. These turnpike roads are now extinct. Where a claim to demind

extinct. T. is made, there is a distinction between a toll thorough (through) and a toll traverse (across); the former being granted in consideration of the performance of a continuing beneficial service, such as the repair of a road or the maintenance of a bridge or

pass over the land of e toll. Carriages em-

military service are yment. Other kinds anslation was in 1681.

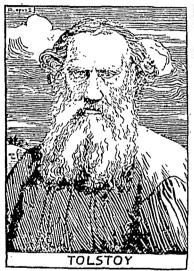
Tolentino (ancient Tolentum Picenum), a tn. of Macerata prov., tlaly, 11 m. S.S.W. of Macerata. The cathedral and the church of San railway companies, as a statutory catervo are interesting. A treaty was Highways.

Tolmezzo

Tolmezzo, a tn. of Venetia, Italy, in the Alps (alt. 1000 ft.) on the Tagliamento, 26 m. N.N.W. of Udine. Pop. 5200.

Tolosa, a tn. in the prov. of Guipuzcoa, Spain, 15 m. S.W. of San Schastian. It manufs. copper-ware, paper, leather, and arms. Pop. 8200.

paper, leather, and arms. Pop. 8200.
Toistoy, Count, Leo Nikolaievitch (1828-1910), a Russian novelist, poet, and social reformer, of noble family born at Yasnaya Poliana in the government of Tula. Being left an orphan at the ago of nine, he was brought up by an aunt, and with his brothers studied under a French tot out 11 142 graph he was early to the state of the s tutor until 1843, when he was sent to the University of Kazan. He did not distinguish himself scholastically,



and on leaving college gave himself up to pleasure for some years. In 1851 he joined the Russian artillery in the Caucasus, and on the outbreak of the Crimean War took command under Prince Gortchakov and fought at Silistria (1854), and at Schastopol (1855). During these stirring times he wrote a series of brilliant war sketches entitled Tales from Sebastopol which made him famous among literary circles in St. Petersburg. He had previously contributed to the Russian written Child-Morning; Boy-

Cossacks. On his return to St. Petersburg after the ortho- and para- compounds are war he was welcomed into the gayest employed in the manufacture of dyes.

on their lines. See Pratt, Law of sociale ireles and the most exclusive literary cliques. At this time he won the admiration of Turgeniev, but the respect they had for each other did not grow into anything warmer on account of their fundamental dif-ferences of opinion. T. now came under the influence of the progressive socialistic movement in Russia, and freed the serfs on his estate. novel, Polikushka, shows how deeply he was moved by the wrongs of the peasants. In 1862 he married Sophia Behrs, and henceforth gave himself up to studying and supplying the needs of the poor. He now began his two great masterpieces, War and Pence and A ma Karenina, and in 1880 published his religious experiences in My Confession. His later works were written with a conscious didactic aim, and include Ivan llyitch, Kreutzer Sonata; The King-dom of God is within You; and What is Religion? In 1895 he renounced his property, gave up all his money and. worldly goods, and henceforth lived the life of an ordinary peasant. His Works were translated into English by N. H. Dole (19 vols. 1889-90).

See Lives by Birukoff (1905, 1906),
Aylmer Maude (1908, 1910), and
R. Rolland (Eng. trans. 1911).

Toltees, a semi-legendary people of

Mexico and Central America. whom the Astees and Mayas ascribed many cities, monuments, and arts, whose certain origin was unknown. The legendary history of the great national hero, Quetzalcoati (d. 895 A.D.), is found in Historia de Colhuacan y de Mexico. See Seler's Commentary (Eng. Keane), 1901-2. trans. bv

Tolu, sce Balsam. Toluca, or Toloccan, a tn. of Mexico, cap. of the state of Mexico, 36 m. W.S.W. of the city of Mexico. It manufe. cotton stuffs, flour, and wax candles. The Novado de Toluca, an extinct volcano (14,950 ft.), lies S.W. of the town. Pop. 31.247.

Toluene, Methyl Benzene. Phenyl-methane (C_6H_5 .CH₃), a mobile liquid (boiling-point 110° C.) which resembles benzene in most respects. It is prepared from the 90 per cent. benzol obtained from coal-tar and is used in the preparation

of dyes. Toluidine, the Ts. or amido-toluenes (C₆II₄(CH₂)NH₂), are prepared from the corresponding ortho-, meta-, and para-nitrotoluenes by reduction. Ortho- and meta- T. are oils boiling at 197° and 199° respectively. Paratoluidine is crystalline, unlts at 45° and boils at 198° C. The Ts. resemble aniline in all their reactions and the

Tomahawk, the war-hatchet of the N. American Indians. Originally they were composed of a stone head tied to a wooden handle by leather thongs. One end of the stone was sharpened and the other hollowed into a pipe bowl, to which the hollow handle acted as stem. Subsequently steel and iron heads were introduced by! Europeans.

Tomaszov, or Tomaszov Fabryeny, a tn. of Piotrkow gov., Russian Poland, 41 m. N.E. of Piotrkow, with manufs. of wooliens, flour, and fron goods. Pop. 21,000.

Tomato, or Lycopersicum esculentum, an annual plant (order Solanaceæ), bearing globose red or yellow fruit, formerly known as 'love apples,' which within a few years came into immense popularity in Britain, its production, chiefly under glass, now being a large and important industry. Except in sheltered and especially favoured situations, and when the season is sunny, the culture of the fruit out of doors is unsatis-factory. The plants are raised from seed early in the year in warmth. The plants are confined to a single stem, shoots at the axils of the leaves being regularly pinched out. Liberal watering and manuring are necessary while the fruit is setting. Late fruit may be ripened in the dark in a temperature of 50 degrees.

Tomb (Gk. τύμβος), signifies, in its strict meaning, a mass of masonry or stone-work raised immediately over a grave or vault used for interment; but it is often applied, in a wider sense, to any sepulchral structure. Of primitive sepulchras there are two classes—one subterraneous, the other of raised mounds or tunuli. Monuments of the first kind are numerous in Egypt; the Pyramids, though more artificial in form and construction, had no doubt a common origin with the Tunulus. At some places in Etruria the Ts. are hewn out on the sides of rocks and hills, and present an architectural façade forming their entrance. Sepulchral edifices are numerous throughout Latium and Magna Greeis, many of which must have been remarkable on account of the architectural decora-tion bestowed on them. The Ts. of tion bestowed on them. The Ts. of the middle ages are within buildings, churches, chantries, cloisters, etc., and exhibit almost every variety of form and enrichment, from the primitive stone coffin to the lavishly-

Tom, a riv. of Siberia, after a N.W. 13th century, with a recumbent course of about 400 m. joins the Obi, figure of the deceased upon it. extended, with the hands slightly raised tended, with the names sughtly raised and joined as if in the attitude of prayer. Altar and Effigy Ts. were usually placed between the piers of an arch, or within a recess in a wall, and in either case the whole T. was frequently covered by an arch forming a sort of canopy over it; of which kind is that of Aymer de Valence in Westminston Abbar Westminster Abbey.

Tombac, an alloy ot 16 parts copper, 1 part zinc, and 1 part tin. Red T. consists of 10 parts copper to 1 of zinc, and white T. of 75 per cent. copper and 25 per cent. tin.

copper and 25 per cent. tin.

Tombigbee, a riv. of U.S.A., riscs in Prentles co., Mississippi, and flows S. to unite with the Alabama R. to form the Mobile R. Longth 500 m.

Tomi (lator Tomistar, or Jeyni Pangola; modern Kustande, or Constanta), a tn. of Thrace (later Moesia) on W. shore of the Euxine. It was coree central of Sorthia Minor and is

on W. shore of the Euxine. It was once capital of Scythia Minor, and is famous as the place to which Orid was banished. T. was colonised from Miletus (c. 600 B.C.).

Tommaseo, Niccole (1802-74), an Italian writer and politician, born at Schenico, Dalmatia. Early in life he acquired an interest in public affairs, and attached binself to the Italian. and attached himself to the Italian Liberal party, in 1848 becoming Minister of Public Instruction. Howas sent to Paris to seek the ald of France, and after the capitulation went first to Corfu and later to Tunis and Florence. It was at the first named (Corfu) that he wrote his famous Supplicio d'un Italiano. Ho was a prolific and varied writer, amongst his most important publications. tions being: The Duke of Athens (novel), The Second Exile, Italy (political writings), A New Dic-(political writings), A New Dictionary of Synonyms of the Italian Language, etc. His Letters were edited by Verga (1994).

Tompkins, Daniel D. (1774-1825), an American politician, was governor of his native state of New York from 1807-25, and rendered signal service to his country during the war with England in 1812 by making himself

engiand in 1812 by making himself responsible for the ediciency of the New York militia.

Tomsk: 1. A gov. of W. Siberia, Russia, 327,173 sq. m. in area, bounded N.W. by Tobolsk, W. and S. by Semipalatinsk, S.E. by N.W. Mongolia, E. and N.E. by Yeniselsk. This yask track is densely model. This vast tract is densely wooded This vast tract is density wooded in the N., contains the fertile but marshy Baraba steppe below, and still further S. the valleys and Alpine tracts of the Altai Mts. The Obi with its tributaries is the chief river. Corn decorated canopied monuments. tracts of the Altai Mis. The Obi with Another class consists of Allar or lits tributaries is the chief river. Corn Table Tombs. The next in order is the and tobacco are cultivated, mining Effloy Tomb, first introduced in the is carried on, and draught horses

are reared. mainly Slavs (90 per cent. Russians), Ostyaks, Tartars, nomad Samoyedes, and Mongol tribes being found also. Pop. 3,170,300. 2. The cap. of above, an episcopal see, the largest city of A branch line connects it Siberia. with the great Siberian railway at Talga, and there is steamer communication with Barnaul and Bijsk and up to the Urals. The university dates from 1888. The chief industries are tanning and the manuf. of carriages. Pop. 107,711.

Tom Thumb, see DWARF. Tomtit, see TIT.

Ton, or Tun, a measure of weight, equivalent to 20 hundredweight. In Equivalent to 20 interedweight. In England each hundredweight (cwt.) contains 112 lbs., so that the T. has 2240 lbs., but in parts of the United States only 100 lbs. is reckoned for each cwt., bringing the value of the T. to 2000 lbs. The former is known as the 'long' T., the latter as the 'short' T. Sce Tonnage.

Tonalite, a type of quartz digrite

Tonalite, a type of quartz diorite und in the Adamello Alps. Plagiofound in the Adamello Alps. clase quartz, hornblende, and biotite are dominant minerals, with magnetite zircon, etc., as accessories. granite-diorites of the U.S.A. are eimilar rocks, and the type is also found among the Scottish plutonic

rocks.

Tonawanda, a tn. of New York, U.S.A., in Eric co., on the Eric Canal, with shipbuilding, iron working, and lumbering industries. Pop. (1910) 8290.

Tonbridge, or Tunbridge, a tn. of Kent, England, on the Medway, 27 m. S.E. of London. It has a 16th century grammar school, and is famous for its inlaid wood ware. Pop. (1911) 14,797.

Tone, in music, is the interval of a ajor second. It is also used to inmajor second.

dicate the quality of a sound, Tone, Theobald Wolfe (1763-98), a United Irishman, was called to the Irish bar in 1789, but devoted himself to politics, and printed articles attacking the government and in agitating against it. He went to the United States in 1795, and in the following year to Paris, where he was active in efforts to promote an invasion of Ireland. He was given a command under Hoche, whose expedition did not effect a landing. was captured in 1798 on a vessel in Hardy's squadron, and was tried by court-martial, which sentenced him to death for treason. His Autobiography was published in 1893.

Tonga Islands. FRIENDLY see

ISLANDS.

Tongaland, see AMATONGALAND.

The inhabitants are prov., 20 m. S.S.W. of Lake Taupo. The northern plateau, to which the name is generally confined, has eight craters. To the S. is Ngauruhoe (7515 ft.), which was in eruption in March 1909. The Red Crater and Te

Mari are also still active. Tong - king, or Tonquin: Indo-French possession of N.E. China, Asia (acquired 1884), forming with Laos (acquired 1892) one of the five French dependencies in It is bounded N. by Indo-China. the Chinese provinces Kwang-tung, Kwang-si, and Yun-nan; W. by Laos: S. by Annam; E. by the Gulf of Tongking. The Song-Koi or Red R. flows from N.W. to S.E. The mountainous, plateau, and forest land lies chiefly N. and W.; there is flat, low-lying fertile land to the S.E. Area 46,400 sq. m. There are a number of small islands off the coast. Gold, silver (at Ngan-son), antimony, tin, and coal (at Hongai) are found. Teak, ebony, and sandalwood are the most valuable woods produced. Round the able woods produced. deltas of the Red R. and the Thaibinh rice is extensively grown. other parts are plantations of coffee, tobacco, ramie, cotton, jute, sugar-cane, and mulberry. Vegetables, cane, and mulberry. betel-palms, areca-nuts, bamboos, hemp, indigo, gamboge, pepper, and cinnamon are also produced. The litchi (lichee or leechee) tree is a native of T. Haiphong is the chief port and Hanoī the capital. Hanoī replaced Saigon as capital of French Indo-China (1902), and is connected by rail with Haiphong and with Vinh. It has various mills, foundries, distilleries, and breweries, school of medicine for natives (opened 1902). T. formed part of the kingdom of Annam until the French residency was created in 1884. Pop. (1911) 6,119,720 (about 7000 Europeans). Consult Imbert, Le Tonkin . . ., 1885; Dupuis, Le Tong-king, 1898; De Lajonquiere, Ethnographie du Tongking Septentrional, 1906; Gaisman, L'Œuvre de la France au Tong-king, 1906. See Indo-China, French.
2. Gulf of, an arm of the China Sea, of average breadth 150 m., receiving the Song-Koi. It is bordered by Kwang-tung, and Hainan Island.

Tongres (ancient Tongri), a tn. of Limbourg prov., Belgium, on the Jaar, 12 m. N.W. of Liege. It has distilleries, tanneries, and a minoral mentioned by Pliny. well,

10,200.
Tongue, a movable muscular organ and concerned in the operations of mastication, deglutition, speaking, The T. consists of a Tongariro, a group of volcanic and tasting. The T. consists of a mountains in the N. part of the North mass of muscle symmetrically ar-Island of New Zealand, Wellington ranged about a middle line from tip

to root. The base is attached to the or shrub, native of Guiana, bearing mucous membrane is situated in the middle line of the under surface; this is the franum lingua, or 'bridle' of the T. The substance of the T. is striped muscle. It is supplied by branches of the lingual artery, whose origin is the external carotid. The nerves of the T. are the gustatory, for touch and taste sensations, the glossopharyngeal, supplying the posterior Before 1836 (third, and the hypoglossal, which was in use a much rougher and more conveys motor stimuli. The surface inad builders'

liable to many morbid changes. By easily-recognised phenomena of furring, etc., the existence of disease of the alimentary canal is indicated. Acute inflammation is caused by wounds, and may lead to the forma-tion of abscesses. Chronic inflammation is due to prolonged irritation, as by a broken tooth or excessive smoking. It may be followed by excessive growth of the surface cells leading to the formation of a cancer. Cancer of the T. is particularly painful and dangerous, the only hopeful treatment being early removal by surgical operation.

Tonic, in medicine, an agent which re-establish the proper tends to performance of the functions of the body in general, or of some particular organ. Ts. differ from stimulants in that the latter produce a transient effect rapidly, while the former gradually build up a permanent effect. Among general Ts. are vegetable bitters, cold baths, exercise, etc.; iron and arsenic are blood Ts.; dilute acids are gastric Ts.; digitalis and strophanthus are cardiac Ts.

Tonic, in music, the fundamental key-note of a scale. See Music.
Tonic Sol-fa, see Solmisation.

Tonikas, The, a tribe of N. American Indians, now practically extinct. They dwelt in E. Louisiana and Mississippi. In 1886 some twenty odd tribesmen were living in Marksville (Louisiana).

Tonite, an explosive formed by mixing fifty-four parts of wet gun-cotton pulp with forty-six parts of barium nitrate.

Tonk: 1. Chief tn. of the native state of Tonk, Rajputana, India, near the Banas R., 60 m. S. of Jaipur. Pop. 38,760. The state has an area of 2752 sq. m. Pop. 275,000. 2. A ta. in the Dera Ismail Khan dist., N.W. Frontier Province, India. Pop. 4400.

dorsum, is free; the edges and the anterior portion of the lower surface, or racemes of purple flowers followed by dorsum, is free; the edges and the almond-like legumes. The beans are are free. A fold of the investing put amongst clothes to perfume them and to repel insects.

Tonkin, see Tong King.

Tonnage, of a ship is the measure of its cubical or carrying capacity expressed in tons. There are now in use four methods of expressing the T. of a ship, known respectively as the gross T., the r weight T.,

which

referred s T., the wnol the ship below the T. deck is found, together with that of all covered-in spaces on deck used for stowage, and the result in cubic feet is divided by 100, a register ton being a measurement

of space calculated from the average bulk of light freight. The net register T. is the gross T. minus all those spaces used for the working parts of the ship or for the accommodation of crew or instruments. It is on this T. that dues are almost invariably paid. The dead-weight T. is the measure of

* too deep in

ment T. Is that in use since 18/2 for all ships of war throughout Europe. The amount of water displaced by a ship is, of course, equal in weight to the ship and all that it contains. Since 35 cub. ft. of water weigh one ton, the displacement T. is found by dividing by 35 the number of cubic feet of water displaced when the ship is immersed to its draught or load-line.

Tonnage and Poundage. Tonnage, a tax of from 1s. 6d. to 3s. levied on each tun of wine or liquor imported into or exported from the United kingdom; and poundage, a similar tax of 6d. to 1s. on every pound of dry goods, were first levied in 1371. James I. claimed to alter the rates of levy as he chose by means of additions called *Impositions*, and managed through his certific indees to aged through his servile judges to secure a decision in his favour on the legality of such additions against the merchant Bate. Parliament never ceased to protest against this in-fraction of their right to control taxation, and the resistance of Hampden to the collection of the tax precipitated the Civil War, after the close of which no further levy was ever made.

Tonnage Dues. Rates levied on the Tonka, or Tonquin Bean, the seed tonnage of ships entering ports or of Dipleryx odorata, a leguminous tree navigating public waters. Such rates

are imposed by local Acts; and the overgrowth of the substance of the mode of computing tonnage for the purposes of the dues may be that set out in the particular local Act, or may, with the consent of the Board of Trade, be on the registered tonnage made under the Merchant Shipping Act, 1894. By the constitution of the U.S.A. no state may impose T. D. without the consent of Congress; but a municipal corporation may levy a wharfage rate on the owners of unused steamboats mooring at a wharf.

Tonnay-Charente, a tn. in the dept. of Charente-Inférieure, France, on the Charente, 4 m. above Rochefort; is an important river port, and exports Cognac brandy. Pop. 4900. Tonneins, a tn. in the dept. of Lot-

et-Garonne, France, on the Garonne. 10 m. S.E. of Marmande. It has a national tobacco factory. Pop. 6600. It has a

Tonnere, a tn. of France, in the dept. of Yonne, on the Armançon R., 27 m. S. of Troyes, famous for wine.

Pop. 4500.

Tonquin, see Tong-King.
Tonguin, see Tong-King.
Tönsberg, a fort. seaport, Jarlsberg-Laurvik amt, Norway, near the Christiania Fjord, 72 m. W.S.W. of Christiania. It is one of the oldest towns in Norway (871 A.D.), and is the headquarters of the sealing and whaling fleet. Near here are the ruins of an ancient fortress and royal resi-

dence. Pop. 8600.

Tonsils, a pair of almond-shaped bodies situated in the fossa between the pillars of the fauces in the pharyngeal cavity. Each consists of a mass of lymphoid tissue plentifully supplied with blood vessels, and is covered with mucous membrane which dips into depressions called crypts. The T. secrete a viscous fluid which acts as a lubricant to the respiratory passages. Inflamma-tion of the Tonsils, tonsilitis, is caused by the introduction of septic organisms through the mouth, or by way of the blood. It usually com-mences with slight rigors, and the characteristic swelling soon makes its The swelling is accomappearance. panied by pain, and swallowing and even breathing may be rendered difficult. The temperature rises and usually a certain amount of suppuration takes place. A yellowish secretion appears on the surface of the T., which may be brushed away removed by gargling. Hot poultices should be applied to the neck, and if suppuration has taken place the T. should be stabbed to release the pus. The inhaling of steam mixed with antiseptic vapours is useful in relieving the condition. In chronic ton-

T., which is best dealt with surgically.

Tonson, Jacob (c. 1656-1736), chief of the famous firm of publishers and second son of Jacob T., the surgeon. He was apprenticed to a stationer for cight years, and having been admitted a freeman of the Stationers' Company in 1677, began business on his own account. T purchased Dryden's Troilus and Cressida in 1679, and in 1681 acquired the valuable property of a half-share in the rights of Paradise Lost, of which he bought the other half in 1690. Afterwards he became associated as publisher with the principal men of letters of his day, including such as Steele, Pope, Addison, Congreve, and Wycherley. Jacob T. retired from the business about 1720.

Tonsure, the cutting of the hair in certain form as a symbol of selfdedication to the monastic life. custom first appears in the end of the 4th or beginning of the 5th century. In the ancient Celtic Church all the front of the head was shaved in front of a line drawn from ear to ear. the Oriental churches the whole head is shaved. In the Roman Church the coronal of St. Peter, has always been used. In this T. the crown of the head is shaved to leave a fringe of

hair all round.

Tooke, John Horne (1736-1812). an English politician and philologist, took holy orders in 1760, but resigned his living in 1773. His Radical propaganda led to his being tried for high treason in 1794, but he was acquitted. He published in 1786 The Diversions of Purley, and was the author of many pamphlets. There is a biography by Alexander Stephens, 1813.

Tooke, William (1744-1820), an English historian and divine. He became chaplain of the English church at Cronstadt, and in 1774 chaplain in St. Petersburg. He published Russia, 1780-83; Life of Catherine II., 1798;

History of Russia, 1800.

Toole, John Lawrence (1832-1906). an English actor, went to the City of London School and soon deserted a wine merchant's office for the stage. For him the years 1852 to 1896 were one perpetual round of acting, now in Edinburgh, now in London, where he played at the Adelphi (1858-67) and at his own theatre (1882-95), now in America, where he was a comparative failure (1874), later in Australia, where he was a complete success (1890), and finally in the provinces, where he made an annual tour from 1857 onward. Characterised often as the last great low comedian of the old school, T. excelled, nevertheless, sililis there often occurs a permanent in serio-comic parts, like Michael

Garner in Byron's Dearer than I Stephen Digges in the play of name, an adaptation of Le Goriot, Caleb Plummer in Dot—Boucicault's version of the Cricket on the Hearlh—and Dick Dolland in Uncle Dick's Darling. Other of his most brilliant rôles were Spriggins in William's farce, Ici on parle Français, Tom Cranky in The Birthplace of Podgers, and Paul Pry.

MUSIC DITIONAL FORCE THE PROPERTY OF THE PROPE producing objects in which circularity plays a part. Such objects are in-numerable, and their production dates back to very early times. It is, however, only recently that the lathe has been able to produce accurate work owing to the fact that it was only during last century that the slide-rest was invented, which affords a rigid support for the T. and can traverse it parallel to the piece that is being worked. The scrow-cutting lathe has a slide-rest which is moved along at a uniform speed by gear wheels, which are in turn connected to the object on which a screw is to be cut: threads can be cut by this means from 14 in. pitch upwards. Modern large lathes are used for gun work and for finishing the treads and cranks of wheels and axles. The Niles-Bement-Pond Co., have made a lathe 154 ft. between centres, weighing 165 tons, for boring and turning guns. On such lathes several T. are carried at once, performing different opera-tions on various parts of the material. Turret lathes, both hand worked and automatic, play a large part in the production of articles which have to be produced in quantities. Turrets are usually hexagon and carry six T., are usually hexagon and carry six 1., thus permitting of six different operations on the object. Such lathes usually have a hollow headstock, through which a continuous har of metal is passed. As an example, we may quote the manufacture of studs by which cylinder covers are held in place. First, the headstock the headstock

it is turned to fourth operations screw cut it both ends and finally it is cut off. All these motions are performed entirely automatically by means of a trip action, which engages with the requisite stops. The next important piece of machinery is that for producing a truly level surface. The planting machine was invented about 1825 by Joseph Clement. In these machines the work moves under stationary T. on a rolling bed. If the work has only to be done in one direction, a quick return motion is employed, involving the use of two different sized pulleys, or else the drive is per-

and an automatic is employed; of lown is put on the market by Messrs. Vickers, Ltd. Owing to the great weight of certain objects which require planing, such as armour for battleships and the like, the energy for reversing the mass is much greater than that required for the actual cut, hence for such work the machines often have a fixed bed and movable T. But to-day planing is being largely superseded by milling, where a rod or disc has a serrated and sharp edge, shaped to the cut required. This milling-cutter is kept revolving at a high rate of speed and quickly removes the surface presented to it: whereas a planer can only remove at the outside limit a piece of material in. who for each T., which seldom exceed four in number. Other T., which help to make the complicated mechanical productions of modern life are the drilling machine, the slotting machine, the shaping machine, and the boring machine.

and the boring machine.

Drilling machines on certain occasions are of the multiple variety, i.e. several spindles are worked at once, if it is necessary to drill a great many holes in a plate, such as a boller firebox or the like. Adaptors are also made nowadays for fitting taps into small drilling machines, so that it is possible to tap small holes by this machine, instead of having to use hand labour.

Shaping machines are really places.

Shaping machines are really planers on a small scale with moving T., the mechanism employed is of the steam engine type, i.e. the T. is moved by means of a crank and connecting rod; it is used on light work for facing up cottars and the like.

Boring mills may be either horizontal or vertical; they are largely used for cylinders and guns, and the like. In these days of quadruple expansion marine engines it is necessary to be able to bore cylinders up to 12 ft. in diameter; or as regards length to be able to bore a hole 15 or 16 in. for some 60 ft. in length, as is necessary for big guns and large pro

pellor shafts.
Lastly, the wood-worker has not the universal will cut holes of any sort of shape out of wooden blocks, where formerly the work had all to be done by haud. See Ency. Brit. Tools'; Dunkerley's Mechanism.

Toombudra, or Tungabhadra, a riv. of S. India, the chief trib. of the Kistna, is formed by the junction of the Tunga and Bhadra which both riso in the Western Ghats. Length, 400 m.

Toothache, see TEETH.

parasitic and partly eaprophytic.

I. squamaria, the only British species, has a fleshy branched rhizome clothed with tooth-like scales and bearing a raceme of drooping dull red flowers.

Toowoomba, a tn. of Queensland, Australia, 101 m. W. of Brisbane, is situated in a wine-growing and agri-cultural dist. It has tanneries, breweries, and flour mills. Pop.

16,160.

ropaz, a mineral crystallising in the rhombic system and having a per-fect basal cleavage. It is a silicate of alumina with fluoride [(AlF),SiO_d]. The colour of T. varies from yellow to white, blue or pink, and the mineral is more or less transparent (H=8, sp. gr. 3.5). On heating it becomes electrified (pyroelectric). T. is used extensively in jewellery; the pink colour of most of the jewellers' stones, however, is produced artificially, the stone being wrapped in amadou (tinder), which is ignited and allowed to smoulder away. In the British Isles the stone has been found in Corn-wall, Aberdeen, and the Mourne Mts. specimens are obtainable Brazil, Peru, Ceylon, and Siberia. See Stones. Precious.

Tope, or Stupa, known as ' Dagoba' in Ceylon, is a structure erected by Buddhist monks to enshrine relics of Buddha or his disciples. The Ts. are surrounded by a massive stone railing with lofty gates. The most noteworthy is at Sanchi in Bhopal.

Topeka, the cap. of Kunsas, U.S.A., and co. seat of Shawnee co., on the Kansas R., 58 m. W. of Kansas City. It is a large manufacturing centre

and in the vicinity are quarries and coal mines. Pop. (1910) 43,684.

Topelius, Zakris (1818-98), a Finnish man of letters, was professor at Heidelberg from 1863-78. For tune smiled on him, whether he turned journalist, novelist, playwright, or poet. He edited the Heisingfors Gazette (1841-60); wrote five volumes Gazette (1841-60); wrote five volumes of excellent historical fiction called Tales of a Barber-Surgeon (1853-67); witnessed a successful performance of his tragedy, Regina von Emmeritz (1854); and was gratified by the ready sale of his volumes of patriotic, smooth-flowing, and charming lyrics,

entitled Heather Blossoms (1845-54).
Tophane, see Constantinople.
Tophet ('the place of burning'), a
high place in the valley of Hinnom,
where sacrifices used to be offered to

Moloch.

Topiary, the pruning of trees and shrubs into formal and fanciful shapes. The art was most developed shapes. The art was most developed in the 16th century, and has been revived in recent years. It requires a

Toothwort (Lathrea), a genus of great deal of trouble and some skill plants (order Orobanchacem), partly to check the over-development of to check the over-development of branches and shoots. No tree is better suited to T. than the yew, but the holly, box, and hawthorn bear training and clipping well.

Top-knot (Zeugopterus), a genus of

flat fishes, two species of which occur in British seas, Miller's T. (Z. puncta-tus) and one-spotted T. (Z. unimaculatus), which is a more southern form than the other.

Toplady, Augustus Montague (1737-78), an Anglican divine and hymnwriter, born at Farnham, Surrey. He entered the Church in 1762, and became vicar of Harpford (1766) and Broadhembury (1768). In 1775 he became minister at the French Calvinist Chapel in London. His best known hymn is 'Rock of Ages'; in prose he wrote Historic Proof of the Doctrinal Calvinism of the Church of England, 1774.

Töplitz, see TEPLITZ.

Topography (Gk. τοπογραφία, from roms, place; yapatur, to write of), a written description of places. By custom the word is limited to the description of cities, towns, villages, castles, and churches, including notices of while building the contraction. of public buildings, history, trade. population, etc.

Topsail, see Sails and Rigging.

Top-shell, a name for various gastropod molluses belonging to families Trochide and Turbinide, with shells somewhat resembling a pegtop in shape. The shells are pearly within and the external surface is generally highly ornamented and brightly coloured.

Torah, the Hebrew word for law. The word is generally used for the written law, i.e. the five books of the Pentateuch, though primarily it has

no such special significance.

Torbanite, see BOGHEAD COAL. Tor Bay, a fine harbour in the S.E. of Devonshire, England, well protected from westerly winds. It was the landing place of William of Orange (1688).

Torelli, Giuseppe (1721-81),mathematician, Italian born яt Verona. He edited in Greek and Latin all the works of Archimedes, the work of his lifetime, which was published posthumously Clarendon Press in 1792. bу

Torelli, Laelio (1489 - 1576), an Italian writer of noble birth, born at Bano. He became governor of Benevento and podesta of Florence, and in 1546 secretary to the grand duke of Florence. He wrote legal tracts and a Latin eulogium on Duke Alexander of Medici (1536), and edited the Florentine manuscript of the Pandects (1553).

Torena, Quelpo de Llane y Gayose

de, Count (1840-90), a Spanish states and disastrous fires. The tractextends man, born in Madrid. He entered par usually for about 30 m., and the liament in 1864, and remained fuithful to the Bourbons during the period of revolution. After the Restoration he occupied many prominent positions.

Torenia, a genus of plants (order Scrophulariacem), with racemes of finely-coloured flowers. They are often grown in hanging baskets in the

greenhouse.

Torfason (c. 1640-1719), an Icelandic scholar and antiquary; studied at Copenhagen. King Frederick III. appointed him interpreter of Icelandic scholar and appointed him interpreter of Icelandic State of landic manuscripts, and a short time afterwards sent him to Iceland for the purpose of collecting manuscripts. The collection which he brought back is preserved in the Royal Library in Copenhagen. He became royal historiographer for Norway (1682). He wrote: Hist. Rerum Noruegicarum, 1711; Hist. Rerum Orcadensium, 1715; Series Dynastarum et Regum Dania: Groenlandia Antiqua, 1705; and translated several See beskrivelse, 1788. Icelandic works into Danish. Kevnets-

Torgau, a tn. of Prussia, in the prov. of Saxony, on the Elbe, 30 m. N.E. of Leipzig. Its fortifications were levelled in 1889. Glass, pottery, and gloves are made. Pop. 13,491

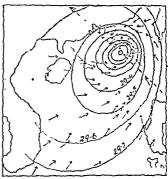
Torjok, or Torzhok, a tn. in the gov. of Tver, Central Russia, on the Tvertsa, 36 m. W.N.W. of Tver city. It is a river port, and manufactures

leather. Pop. 15,120.
Tormentil (Potentilla tormentilla), a small trailing plant (order Rosacce), with yellow flowers, common on

heaths and dry banks.

Tornado, a cyclonic disturbance of the atmosphere, occurring usually in the S.E. of a slow-moving 'primary', most common in U.S.A., E. of 100°W. long., but particularly in Kansas and Illinois. Usually it arises suddenly in sultry summer afternoons. They are of small diameter, a few hundred yards, but of great proportional vertical height. The upper portion is marked by a swirling funnel-shaped cloud which sways and rises and falls. Local surface conditions give rise to rapid heating of a column of moist air by the sun, and sudden expansion takes place: the condensing moisture adds to the temperature of the whirling air and very low pressure results. the force developed cuts a clean path through town or country; trees are uprooted and whirled outside the uprooted and uproof outside the uproof of 1,649,887, and its exports own internal pressure as the low pressure encloses them; the damage in 1911 numbered 3192, with a tonto houses often leads to escape of gas and its exports in 1911 numbered 3192, with a tonto houses often leads to escape of gas and its exports. The force developed cuts a clean path

energy is dissiputed in about an hour, very destructive T. visited S. Wales in Oct. 1913, springing up near Merthyr-Tydvil and dissipating in



Cheshire. The water-spout at sea is a similar phenomenon. See Mill, Realm of Nature (new ed.), 1913; Davis, Elementary Meteorology, 1894.

Tornea, a tn. of Ulcaborg gov., Finland, at the head of the Gulf of Bothnia, where it is entered by the R. Tornea, which forms the boundary between Finland and Sweden. Pop.

1400.

Toro, a city of Zamora prov., Spain, on the r. b. of the Douro R., 37 m. W.S.W. of Valladolid. T. is an ancient fortified city, containing a Romanesque cathedral (12th century) and the Santa Cruz Palace, the meeting-place of the Cortes of 1371, 1442, and 1505. It has a trade in fruit and wine. Pop. 8500.

Torontal, a co. of S.E. Hungary, bounded on the E. by the Temesvar.

Area 3650 sq. m. Cap. Becskerek.

Pop. 546,000.

Toronto, the cap. of the prov. of Ontario, Canada, on the Bay of Toronto, on the N. shore of Lake Ontario, 333 m. S.W. of Montreal. In population and as a commercial centre Toronto is the second city of Canada, and is connected with all parts of the U.S.A. and Canada by fast steamers and by the Grand Northern, Canadian Trunk, Canadian Pacific railroads. Its chief manufactures are iron rails, agricultural implements, planes, and bleycles; there are gus works, electric plants, breweries, distilleries, foundries, flour

buildings in the town are St. James's (Anglican) and St. Michael's (Roman (Anglean) and St. Melhael's (Romain Catholic) cathedrals, the Law, University, Legislature, and Public libraries, and the various colleces—Knox, Wycliffe, St. Michael's, etc.—federated with the university. There are several parks, including Queen's, Riverdale, Czowski, and Victoria. Riverdale, C Pop. 376,538.

Torpedo, or Electric Ray, a genus of fishes, one species of which (T. hebetans) is occasionally found off the coast of England. Ts. are characterised by the possession of an electric organ which is present between the head and the pectoral fin of each side. The shock which it is capable of ad-

ministering can disable a man.
Torpedo. The use of submarine
mines (q.v.) and Ts. date from the
American War of Secession, when twenty-eight vessels were blown up by the former and six by the latter. Whitehead's T. was due to ideas of Captain Luppuis of the Austrian navy, but was first practically evolved by Whitehead in 1866, whose practical mechanical skill completely altered the original ideas. The first type was too uncertain in vertical direction, but the introduction of the 'balance chamber,' in 1868, obviated the troubles of skimming and diving. The secret was purchased by the British government after successful trials, and in 1876 the servo-motor was added by Whitehead. Further designs were made in 1884 and 1889, and some thirty patterns have been evolved. The modern weapon is 14 to 19 ft. long, the same number of inches maximum diameter. inches maximum diameter, cigar-shaped. In the fore compartment is placed the charge of guncotton (in war time), behind this is the air-chamber filled with compressed air, from pumps aboard ship, for giving motor power; behind this is the balance-chamber, with the steering and balance gear; this is followed the engine-room, and finally another air-chamber for purposes of buoyancy. There are two screw-propellers working oppositely, two horizontal rudders and two vertical ones, which are much smaller. Noncorrodible metal, phosphor-bronze, is used for the body. Fitted to the nose is a pistol for firing the charge, the 'cap,' consisting of a primer charge of 6-oz, discs of dry gun-cotton and a detonating charge of 38 grains fulminate of mercury. The

versity of T., founded in 1827, has has unwound itself and releases the over 5000 students. Other interesting trigger which is still held by a copper pin; on striking, the pin is sheared and the striker explodes the cap. For purposes of practice teak packing takes the place of the charge and a Holme's light, calcium phosphide, is arranged so that the T. may be easily located and picked up again. The air-chamber is of Whitworth compressed steel, and the air is at a pressure of 1350 lbs. per sq. in., equivalent to a weight up to 63 lbs. The balancechamber contains a gyroscope working at several thousands of revolutions per minute, which prevents deviation. In addition, there is a hydrostatic valve working with spring and a pendulum swinging fore These operate the rudders. The valve spring is only pressed in when the desired depth is attained, and the pendulum, not released till this depth is reached, by tilting forward if the nose dips raises the horizontal rudder; if the nose rises the reverse action takes place. This delicate control of levers is in-sufficient to produce the required power when the T. is at good speed,



and a servo-motor, in the enginechamber, working by compressed air, supplies power in much the same way as the steering engine does for the ordinary helmsman. The engines. ordinary helmsman. The engines, made by Messrs. Brotherhood, are single-acting 3-cylinder ones; they develop a power of 30.8 i.h.p. in the Mark VIII. T. The supply of air is carefully regulated; a stop valve prevents leakage; a charging valve admits air to the charging reservoir; starting valve admits air to engines, and delay-action valves by means of a trip-lense prevents starting till the T. enters the water. A reducing valve regulates the supply during the journey, keeping the engines at a steady speed. The Brennan T., used in harbour protection, and under the military authori-ties, was invented by a watchmaker of the name of Melbourne, and purchased in 1882 by the British governcharge of 6-62, discs of dry gun-cotton and a detonating charge of 38 grains fulminate of mercury. The striker projects in front of the nose; on firing the T. a safety pin is first removed which allows motion of a fan on a screw due to motion in the water. After 40 ft. of travel the fan by a high-pressure engine. These are

wound round two small drums inside | made in the Fiske, Govan, Querode, work in opposite directions. The speed of the T. thus increases with the the propeller shaft, a difference in speed of the shore drums, by causing the collar to travel, actuates the rudders, giving a steering radius of 40° either side 'right-ahead.' A flag or Holme's light enables its course to be followed and directed by the operator. The Schwartzkopff T. is in use in the German and Japanese navies, and is similar to the Whitehead. The Howell T., used in the U.S.A. navy, is different in its compartments, and is peculiar in being driven by a fly-wheel connected to bevel-gearing. Motion is imparted to this before launching by a special steam-engine on board ship, the velocity being about 150 rovs. per sec.; the fly-wheel weighs about 100 lbs.



This acts as a gyroscope, but the hydrostatic valve and pendulum hydrostatic valve and pendulum steering mechanism is used. The Sims-Edison T. is also cable controlled, but the motive power is electricity; it is attached by stays to a copper float, which carries vertical rods with ball tops for observation from shore. It has the advantage over the Brennan in that it can be steered in any direction whatever. The Maxim T., following the Brennan in principle; the Nordenfeldt, driven by self-contained electricity; the Lay, used in the Chile-Peruvian War, are other notable wear other notable wear motive power is with heat supplied

to regulate pressur used in the Whitchead in the passage of air to the engine; the 'Elswick' heater, Armstrong, Whitworth & Co., causing a spray of alcohol to ignite in a combustion chamber through which the air passes. The Bliss-the experimental stage unsatisfactory have been learned to the control of the c

the T., and the winding up on the and Orling-Armstrong machines. The shore drums causes a very rapid un- last named, when travelling, throws winding of fine wires on reels carried up a column of water, which serves on the two propeller shafts which for observation as well as a mast to pull of the shore wires. By an in- advantage of only temporary degenious arrangement of a collar on a rangement on being struck by proholiow shaft, working on a thread on jectiles. As yet, however the working on a thread on jectiles. jectiles. As yet, however, the White-head is the most efficient type; it has a range of about 7000 yds, and can attain a maximum speed of 50 m. per hour for part of its course. The spar T., carried on the end of a spar at the bows of a vessel, was very successful in the American War of Secession; but although it is still retained in practice, it is doubtful if it will stand the test of modern warfare with its quick-firing and machine guns. The spar is arranged to lower the T. below the water-line just before striking. With modern higher speed vessels it is fixed ait, with the T. toward the bows; on lowering the T. swings outwards as the vessel passes the objective. It is fired by wires leading from a battery. It may prove useful in modern warfare in the attack on booms or other obstructions in harbours, etc. See publica-tions of the Torpedo Station, New-port, Rhode Is., 1874-1901; Jacques, Torpedoes for National Defence, 1886: Lieut. Armstrong, Torpedoes and Lieut. Armstrong, Torpedoes and Torpedo Fessels, 1896; Sleeman, Tor-pedoes and Torpedo Warfare, 1889; Bucknill, Submarine Mines and Torpedoes as A

1889; Inst.
gineering—
School of Military Engineering.
Torpedo Boat. The first T. B. was built by Messrs. Thorneycroft for the Norwegian government in 1873, for the towing type of torpedo. In 1877 the same firm built the Lightning for the British government; she was fitted with tubes in 1879. This same year saw the construction of the Batoum for the fitted with two

and carrying pedoes; her speed was 22 knots. Up to 1884 many were built for foreign to 1884 many were built for foreign for the period of the nly nineteen. During fifty-four first-class

l down. A length of about 125 it. was the lowest limit for sea-going vessels, smaller ones being built for harbour and coast work. The great considerations for T. Bs. are speed and small size; these rendered the experimental stage unsatisfactory

vessels.

Torpedo Destroyers. The first British vessel of this type, intended Yarrow's Havock. The Boxer, 1895, was 200 ft. long, 19 ft. beam, draught from 6 ft. forward to 7'8 aft; displacement, 250 tons; speed, 29'17 knots. The hull was of finest steel, about in. thick; armament, one 12-pounder and three 6-pounders, with two revolving tubes. In all early types the form of engine was the triple expansion reciprocating, but modern boats are fitted with turbines. A boat built in England for the Brazilian government has a length of 331 ft.; breadth, ment has a length of 331 It.; breadth, 32 ft. 6 in.; draught, 9 to 10 in.; a displacement of 1830 tons; and a speed of 31 knots per hour. It carries both coal and oil fuel, which will carry it for 4000 nautical miles. The armament consists of 4-in. quick-firing guns, four maxims, and three 18-in. tornedo tubes. Speed being all imtorpedo tubes. Speed being all important, defensive armour is out of the question; such boats are practically machinery with the lightest and most rigid form of shell to contain it.

Torpedo Ejector, or Torpedo Tube, a form of gun for ejecting torpedoes. The T. is placed inside and a swinging door closed behind. It is made to fit fairly tight, and a charge of gunpowder, or the impact of compressed air, gives the motive power. The submerged tube has also an outer cap and a sluice valve for draining water out; before firing the cap is re-moved and the tube flooded. A guiding bar, with automatic device for releasing the T., is also fitted and controls the weapon till it is clear of Above-water tubes are of the ship. many patterns, but compressed air or 4-41 pebble-powder cartridges are used for ejection. Revolving tubes are used on torpedo boats and destroyers, allowing for aim apart from

the steering of the vessel.

Torpedo Gunboats, or Torpedo Catchers, have been superseded by the destroyers. The first yessel of the Gunboats, Torpedo type was the German Zeiten, built by the Thames Iron Works Co. The first English vessel was the Scout, 1580 tons; length, 220 ft.; beam, 34 ft.; 3200 h.p.; speed, 17 knots. The Ratllesnake carried a 4-in. breech-The loading, and six 3-pounder quick-firing guns, and was fitted with two tubes. The speed of T. Gs. was at most

about 20 knots.

Torpedo-nets, are suspended from hollow steel spars round vessels as a protection against torpedoes. The spars are placed 45 ft. apart and the nets, measuring 20 ft. by 15 ft.,

factory. Oil fuel, water-tube boilers, weighing 400 lbs., are fitted with and turbines are used in the latest heavy chains at their lower ends to keep them upright in a current or when the vessel is under way. They consist of a mesh of steel wire grummets, 6 in. diameter, connected with galvanised steel wire rings; each net is attached to the ship by a wire rope passed through several meshes at the bottom.

Torpedo-net Cutter, an implement fitted to the nose of a torpedo to enable it to cut the mesh of the tornedonet and so penetrate to the vessel. That used in the British navy is the invention of Sir A. K. Wilson, and will cut the toughest and heaviest nets. Details are kept secret, but most cutters are seissor-acting wire

cutters worked by powerful springs or the momentum of the torpedo on impact, or by special explosion.

Torquatus, the name of a patrician family of the gens Manlia. Titus Manlius Imperiosus, a favourite hero of Roman story, fought against the Gauls (361 B.C.), winning his name T. Gauls (361 B.C.), winning his name T. by taking the necklace (torques) from the body of a mighty Gaul slain by him in single combat. He was dictator 353 and 349, and consul 347, 344, and 340. With P. Decius Mus he defeated the Latins at the foot of Vesuvius. (See Livy, iv. 5, viil. 3-12; Cic. De Off. iii. 31.) Titus Manlius, conqueror of the Sardinians, was consul 235 and 224, and censor 231 B.C. With the hereditary sternness of his family be opposed the ranson of his family he opposed the ransom of his family he opposed the ransom of the Roman prisoners of Cannæ in the Senate (216). He was dictator in 210. Lucius Manlius, consul with Cotta (65 B.C.), helped to suppress Catiline's conspiracy (63), and supported Cicero in his exile (58). Lucius Manlius, son of above, was prætor 49 B.C., and opposed Cæsar on the outbreak of civil war. Obliged to surrender Oricum, he was taken prisoner (48), but released. He fought again in Africa, but was captured and slain (16) on the defeat of the Pompeians. A. Manlius, friend of Cicero, presided at the trial of Milo for bribery as prætor (52 B.C.). He sided with Pompey in the civil war, and was an

roiney in the children can be exile at Athens (45).

Torquay, a municipal bor., seaport, and watering-place, on Tor Bay, S.E.

Devonshire, 20 m. S. of Exeter. Its picturesque scenery and mild climate make it a favourite health resort. Terra-cotta clay and marble are found in the neighbourhood. (1911) 38,772.

Torquemada, Thomas de (1420-98), founder of the Spanish Inquisition; wrested from Queen Isabella a promise to take all steps towards the extirpation of heresy. The 'Holy Office' accordingly was established years as inquisitor-general, burning, it is said, as many as 10,000 martyrs. See Rafael Sabatini, Torquemada and Pop. 8000. the Spanish Inquisition, 1913.

Torques (Lat. torqueo, I twist), a species of gold ornament, worn round the neck, much in use in ancient times. It consisted of a spirallytwisted bar of gold, bent round nearly into a circle, with the ends free, and terminating in hooks, or sometimes in circles.

Torre Annunziata, a seaport of Italy, prov. of Naples, 14 m. S.E. of the town of Naples. It has a royal manufactory of arms, and manufs. macaroni, paper, meat pies, etc. Pop.

macaroni, paper, meat pies, etc. 1 op. 28,084.

Torre del Greco, a watering-place and fishing tn. of Italy, in the prov. of Naples, situated at the foot of Vesuvius, which has often damaged the tn. by eruptions. Pop. 35,500.

Torrens, Lake, a large salt lake of S.

Australia, discovered by Eyre, 35 m. N. of Port Augusta. Its average N. of Port Augusta. breadth is 20 m., length 130 m. It becomes a marsh in dry weath

Torrens, Sir Robert Richard \$4), an Irish colonial statesmar treasurer and registrar-general first legislative council of S. Australia. and was afterwards a member of the first ministry. In accordance with his Real Property Act of 1857, title to land is conveyed by public registra-

tion instead of by deeds.

Torrens. William Torrens M'Cullagh (1813-94), an Irish social reformer; sat as assistant on the special commission through whose agency ------- evetem was extended

y publishing the f Free Nations the anti-Corn

In 1868 he intro-Law movement. duced the Artisans' Dwellings Bill as an instrument for aiding in the clearance of slums, and it was owing to his amendment that in 1870 the London School Board was established.

School Board was escapears to the Torre Pellice, or La Tour, a tn. of Turin prov., Piedmont, Italy, 17 m. from Saluzzo. It is a much frequented summer resort, and the quented summer resort, and the headquarters of the Waldenses.

Cotton-weaving, silk-spinning, and dyeing are carried on. Pop. 6000.

Torres Strait, in the S. Pacific Ocean, between New Guinea and Australia, from 80 to 90 m. broad. It contains several islands, the chief of which are Clarence and Prince of Wales Is. Reefs and shoals abound, rendering navigation difficult.

Torres Vedras, a tn. with a Moorish citadel, on the Sizandró, 26 m. N.N.W. of Lisbon by rail, in Portugal. It figured in the Peninsular War. Pop.

7000.

Torricelli, Evangelista (1608-47), an Italian physicist, acted for three months as Galileo's secretary, and was prompted to many of his dis-coveries by the study of that coveries by the study of that scientist's works. Besides making a barometer—an invention commemorated in the names Torricellian tube and Torricellian vacuum-he solved the problem of the quadrature of the cycloid, and arrived at many fundamental truths in mechanics and hydrostatics. Opera Geometrica (1644) is his principal work.

Torridon Sandstone, in geology, the name given to the series of thick bedded chocolate-coloured sandstones (8000-10,000 ft.) which are exposed in Scotland round Loch Torridon. The Torridonian rests unconformably upon

and quart:

Scottish Cambrian rocks.

Rome, where he was employed by Pope Alexander VI., and afterwards served as a soldier under the Duke Valentino. His talents recommended him to the favour of Henry VIII., for whom he executed a variety of things, but his chief work was the tomb of Henry VII. in Westminster

Abbey, which he completed in 1519.
Torrington: 1. A bor., 24 m. W. of Hartford, on the Naugatuck R., in Litchfield co., Connecticut, U.S.A. Pop. (1910) 16,840. 2. Or Great T., a market tn. on the Torridge, 6 m. S.S.E. of Bideford, in Devonshire, England. In Seven days it was England. In Saxon days it was called Toritone. Pop. (1911) 3041.
Torrington, Viscount, see Byng,

GEORGE.

Torsaker, a tn. in the län of Gesleborg, Sweden, 25 m. W.S.W. of Gesle. Pop. 7771.

Torsion, a strain produced by a twisting motion, that is, by a couple the axis of a prism. The distortion produced is a type of shearing stress. In the case of a cylinder the outer layers slide over the inner layers in the direction of the twist, so that, while the axis remains the same, the exterior takes on a screw-like appearance. Resistance to torsion determines the rigidity of the bar, and resistance to permanent distortion depends upon its clasticity. The amount of 'torque' or twist required to produce T. in cylindrical bars of the same material varies as the fourth

power of their diameters. section other than circular the rigidity is lessened, so that in practical application cylindrical bars are best adapted to resist a twisting strain.

Tort (Lat. tortus, twisted) is an act or omission giving rise to a remedy by action for damages which is not an i action of contract, e.g. trespass (q.v.), turtle (C. squamala), slander, libel, detinue (q.v.), negli-tortoiseshell is derived. slander, libel, detinue (q.v.), negligence and nuisance (q.v.), and assault. A.T. has some of the characteristics of a criminal offence, but is to be distinguished therefrom, though many crimes necessarily include a T. (e.g. a public nuisance causing special damage to an individual; rape), but T. does not amount to a every crime (e.g. slander and seduction are merely Ts), nor does every crime amount to a T. (e.g. blasphemy and treason. Where the T. is punishable summarily and the magistrates dismiss the case, no further proceedings, criminal or civil, can be taken. A cause of action in contract may coexist with a T., i.e. the same facts may give A a remedy in contract against B and also a remedy in T. against C, e.g. where A is injured in alighting on a defective platform, belonging to B railway company, from atrain belonging to Crailway company which enjoys running powers over B's line (Pollock On Torts); conversely there may be two causes of action. one in T. and one in contract with a common defendant; and generally, when a contract inevitably gives rise to duties independently of the contract itself, the breach of them often amounts to a T., e.g. where A pur-chases goods on credit from B, and B resells before A makes default in payment, A can suc B for conversion.

Tortoise, a name for all the land Chelonians, and often applied to all members of the order Chelonia with the exception of the marine Chelonians or turtles. All members of the order are cold blooded, four footed, reptiles. without teeth, and are protected by a shell, or leathery case. All lay eggs, but otherwise there is wide diversity in their habits. They are of great geological age, and their tenacity of life has enabled them to survive where more recent animals of higher types have become extinct. The most familiar example of the land Ts. (Testudines) is the common or Greek T. (Testudo graca) which occurs around the Mediterranean, and is much kept as a pet. It is entirely vegetarian in its diet, though frequently sold as an insect killer. Another T. which is sometimes offered for sale is the river T. (Emys europæa); this is a type of the river and marsh Ts. (Emydes) and is dis-

In bars of this eats insects, worms, etc. Among the rigid-the mud or soft Ts. (Trionycides) are various American and Indian species which are frequently killed for food, the flesh being well flavoured. The most important of the turtles (Cheloniades) are the edible green turtle (Chelonia midas) and the hawksbill from which

Tortoise Plant, see TESTUDINARIA.
Tortoise-shell, in commerce, is the
horny plates of the hawksbill turtle (Chelonia imbrecata). Great cruelty has been exercised in removing the plates from living turtles, but the finest T. is derived from shells immersed in boiling water immediately after the death of the animal. Numerous imitations and substitutes are

made. Tortola, see VIRGIN ISLANDS. Tortona, a tn. in Piedmont, Italy, 13 m. E.S.E. of Alessandria, on the

Scrivia. Pop. (est.) 17,500.

Tortosa, a fortified tn. of Spain, in Catalonia, on the Ebro, 96 m. S.E. of Zaragossa. It is a bishop's see, with a fine Gothic cathedral, dating from the 14th century. It has trade in majolica, paper, soap, and leather. Pop. 25,000.

Torture. The application of bodily pain in order to extort evidence from witnesses or confessions from accused persons has been a feature of almost every judicial system of the world. In England the practice was virtually abolished in 1640. T. was abolished in France at the Revolution (1789); in Scotland by an Act passed in 1709. It was unknown in the German municipalities until the end of the 14th century, but once introduced it remained lawful (though only intermittently resorted to after 1750) Hanover, Bavaria and some of the smaller German states until the first decade of the 19th century, while in Austria, Prussia, and Saxony it virtually ceased in 1750, and in Russia was finally abolished in 1801. The customary modes of T. were the rack, wheel, and thumb-screw, although in England in earlier times it was inflicted by the boot, by fire or water and by peine forte et dure, i.e. by piling weights on the prostrate body of the victim.

Toru, Dutt, see DUTT, TORU, or TARULATA.

Torula, see YEAST.

Tory, a synonym, though historically inappropriate, for a Conservative. The word T. is Irish, and signified. during the time of the wars in Ireland in the reign of Elizabeth, a kind of robber who, being attached to neither army, preved generally upon the country without distinction of Engtinguished by its small yellow spots; lish or Spaniard. They were especially

prominent in the Protestant mas American Indians and Australian sacres of 1841. From this the term aborigines. In several Indian became applied to a body of men who, in 1680, appear to have ridiculed the Popish Plot and yet encouraged the Papists to revive it. Their political object was to banish the Duke of Monmouth and recall the Duke of York, and to further their end they endeavoured to thwart the Bill of Exclusion (from their abhorrence to which they were called 'abhorrers' and their opponents the 'petitioners').
Ultimately the 'abhorrers' and Ultimately the 'abhorrers' and 'petitioners' became identified with the terms Tories and Whigs respectively. See Edinburgh Review, vol. 1., 1830.

Tory Island, off the N.W. coast of co. Donegal, Ireland. Has a light-

house.

Tossia, a tn. of Turkey-in-Asia, 97 m. N.N.E. of Angora. It manufs. Angora goat-hair and woollen stuffs.

Pop. 10,000.

Tostig (d. 1066), Earl of North-umbria, was the son of Earl Godwin. In 1065 he was banished from his realm because of his cruel, repressive measures. The following year he re-turned with Hardrada, King of Norway, and was slain at Stamford Bridge by King Harold.

Totana, a tn. in the prov. Murcia, E. Spain. Chief industr Chief industries, flax-weaving and the manuf. of leather and pottery. Pop. 14,000. Totemism is a belief prevailing

among primitive peoples of bloodkin-ship with or descent from an animal or plant. The word is derived from the Algonquian Indian otem, a totem the algorithm rather from that form of it, totem, which signifies my otem or guardian spirit (pronunced odaim and todaim). The nounced odaim and todaim). The argument of the late Mr. Andrew Lang that totenic or symbolic names, as 'the Snake' or 'the Wolf,' were given by rival and neighbouring tribes to communities which adopted these nicknames, is highly ingenious, but not altogether satisfactory. Certain savage peoples regard the points of the compass as being under the of the compass as being under the dominion of various animal cponyms, which in reality are minor detites, and it is not impossible that this might in some measure account for T. Still it would not account for plant totems. T. is at the root of nearly every mythology, and accounts for such mythologic pherecure as the animal headed goods of nomena as the animal-headed gods of Egypt, which were merely anthropomorphic totems in a state of high evolution. The system was certainly in vogue among the ancient Britons, Hebrews, Greeks, and many other European and Asiatic peoples, and still is so among, notably, the N. birds, natives of tropical America,

nations' each individual of a tribe possesses a personal totem which he receives in a dream induced by drugs or hunger at the age of puberty. The idea of blood-kinship among the members of a totem tribe renders it incestuous for its members to intermarry, so that they are compelled to find spouses from another community. Hence also it is 'wrong' to kill a blood-brother, so the origin of the idea of sin may be seen imbedded in the totemic system. Family crests are regarded as of totemic origin. Indeed the results and vestiges of the system may be remarked as still existent among our modern institutions. Consult Dr. J. G. Frazer, Fortnightly Review, lxxviii.; Lang, Secret of the Tolem; Spencer and Gillen, Northern Tribes of Central Australia: Gomme, Folklore as an Historical Science.

Totila (d. 552), King of the Ostrogoths in Italy, was proclaimed in 541. He at once commenced the restoration of the kingdom of Italy and gained a victory over the Romans near Faenza. Continuing his victorious march towards Rome, he formed the siege of that city in 546, which he captured the same year. In 547 Belisarius recovered possession of Rome and repulsed three assaults of who did not succeed in again taking the city till 549. Owing to T.'s continued successes the Emperor Justinian sent a large army against him, led by the cunuch Narses, in which the Romans were successful, T. which the Romans were successful dying from his wounds a few days

after.

Totnes (the Toteneis of Saxon times), an ancient market tn., with cider browerles, on the Dart, S m. W.S.W. of Torquay, in Devonshire, England. Pop. (1911) 4128.

Tott, François Baron de (1733-93), a French officer, born at Champigny. He was for a time employed in the Eronch employer, at Constantiumle.

French embassy at Constantinople, and in 1767 became consul at the Crimea. Later, he returned to Constantinople, and effected various important military reforms there. He emigrated from France in 1790.

Tottenham, an urban district of Middlesex, 61 m. N.N.E. of London

Bridge, forming part of Greater London. The area is 3014 acres, and the pop. (1911) 137,418.

Toucan, a constellation formed by Bayer (c. 1603) near Phonix in the S. hemisphere. a Toucani, 2:9 magnitude, is a solar star, 8 and 4 are double stars. It contains a gloular cluster visible to the pubed eve. cluster visible to the naked eye.

Toucans (Rhamphastos), a genus of

characterised by their enormous bill and by their habit of bringing up their food after being swallowed to masticate. In confinement, which they bear well, they are almost onnivorous, but in a wild state they probably live chiefiy on fruit. The plumage is brilliantly coloured.

Touch the sense by which contact.

Touch the sense by which contact. masticate.

Touch, the sense by which contact with the skin is experienced. Physiologically T. depends upon the stimulation of the tactile corpuscles, nerve endings which are contained in the papille of the dermis or under-skin. The stimulus is conveyed by the sensory nerves to the brain and gives rise to the sensation of T. The number of tactile corpuscles varies in different parts of the body-surface, so that some parts are more sensitive to T. than others.

Touchstone, see FLINTY SLATE. Touchwood, a soft white tinder-like substance into which wood is changed by the action of Polyporus igniarius

and other fungi.
Touggourt, or Tuzurt, a tn. and cap.
of the Wad Rhirh dist., Algeria, 228 m. from Constantine. Has an altitude of 200 ft., and is a town of considerable commercial importance. Pop. 2000.

Toul, a strongly fortified tn. of France, in the dept. of Meurthe-et-Moselle, is seated on the Moselle, in a plain almost surrounded by mountains. It is 34 m. W.S.W. of Metz. Its fine old cathedral (now the church of St. Etienne) was begun about 965 and took five centuries to build. has trade in wine, brandy, lace, and embroidery. It capitulated to the Germans during the Franco-German War of 1870. Pop. 13,600. embroidery.

Toulon (Toulon-sur-mer), ancient Telo Martius, a naval and military port and first-class fortress of Var dept., France, on a bay of the Mediterranean, 40 m. E.S.E. of Marseilles. Next to Brest in Finisters it is the chief naval station and arsenal of his death. town are on the N.E. side of the inner Touraco (Corythaiz), a genus of harbour. T. contains a mediaval beautiful African birds with an erectile and arsenal, the Musée Bibliothèque, and a convict prison, among other modern prov. of indeed the main to the multicontaint, but some wine, brandy, oil, and fruits are experted and fruits are experted to the first are experted to the first and green and green and purple plumage.

Touraine, a prov. of ancient France, corresponding in the main to the modern prov. of indre-et-Loire. Its important, but some wine, brandy, from the Galliant are experted to the first are experted to the first and green and green and purple plumage. 1912 T. has replaced Marseines as the port of call for the Orient Steam Average of the Orient Steam a port in Annam, French Indo-China, Navigation Co.'s steamers to Egypt, a port in Annam, French Indo-China, Colombo, and Australia. Its original 54 m. E.S.E. of Hué. Coal is mined to the original of the Orient Steam and Arsenal were begun by at Nongson near by. Pop. 5000. 1912 T. has replaced Marsellles as the Touraine and its Story.

port of call for the Orient Steam Tourane, or Turan (Chinese Shohan), Vauban in the 17th century, but Tourcoing, a tn. busily engaged like destroyed by the British, to whom Roubaix, its southern neighbour, in T. was yielded (Aug. 1793), being the woollen and cotton industries, retaken by the French republicans 8 m. N.N.E. of Lille, in the dept. of (Dec. 1793). Napoleon first won Nord, France. Pop. 82,644.

Toulouse, the cap. of the dept. of Haute-Garonne, France, lies on the Garonne, 160 m. S.E. of Bordeaux. The river is spanned by the beautiful Pont-Neuf (1543-1626), which connects the city with St. Cyprien, its suburb. The Canal du Midi makes broad curves on the N. and E. The church of St. Sernin is a splendid Power hegilies. The cathedral, a Roman basilica. structure of many periods, contains the tombs of the counts of T. Noteworthy also are the historic capitole. the 13th-century brick church of the Jacobins, the Hôtel Bernuy, and the Musée with its unique collection of antiquities. The city is also an archbishopric and the seat of a university. Besides a brisk commerce in corn, wine, and horses, all kinds of commodities, from steam engines to ruffle pies, are manufactured. The national tobacco factory is here. In Roman times the town was called Tologa, and it was ruled by counts from 778 to 1271. The execution of the innocent Calas (1762) stains the record of its parliament. 149.576.

Toulouse-Lautree, Henri de (1864-92), a French artist, he studied art in Paris, where he imbibed the in-fluence of Degas. There is a pastel of his in the Pinakothek, Munich: while a monograph on his art has been written by a German critic, Julius Meier-Gracie.

Tour, Maurice Quentin de la (1704-88), a French artist, born at St. Quentin, he lived chiefly in Paris, where he did crayon portraits of many of the celebrities of his day, but he retired to his naive town ere See Maurice Tourneux.

SERGEIEVITCH.

Tourlaville, a tn. in the dept. of Manche, France, 3 m. E. of Cherbourg, with iron and copper foundries.

Pop. (est.) 7500.

Tourmaline, a mineral of variable composition, containing silica, aluminium, sodium, iron, magnesium, boron to travel through Spain and Portugal ete. system, and has a rhombohedral cleavage. compact masses. . black, more rarely green, blue and red, and, still more rarely, colourless.
The black variety is termed schorl brittle. (q.v.)it of its and 3) it is .hard Varieties sometimes cut as a gem. of T. are rubellite (red or pink), indicolite (indigo blue), Brazilian sap-phire (Berlin blue and transparent), Brazilian emerald (green), and peridot Ceylon (yellow). T. occurs granite, gneiss, mica, and chlorite slates and granular limestones; it is states and granular intestories; to the found in Cornwall and Devon, Bavaria and Switzerland. The rubellite variety, used as gens, is found in Ceylon, Siberia, and Ava. The clear transparent varieties are used for making polariscopes, e.g. the 'tourmaline pincette.' See SCHORL ROCK. Tourmente is a snow storm which

descends without warning on the Alps much in the same way as the 'tem-porale' on the Andes. It is naturally a source of danger to herdsmen and chamois hunters.

Tournai (Flemish Doornik), a city with a noble Romanesque and Gothic cathedral and the tomb of Childeric, on the Scheldt, 11 m. E.S.E. of Rou-baix, in Hainault, Belgium. So-called Brussels carpets are manufactured.

Pop. 37,108.

Tournament, Tourney, or Joust, a form of martial sport very popular in the middle ages. Combats took place on horseback between men of noble rank, and a prize was given by the land, and a prize was given by the land, and a prize was given by the land. Indeed, the greatest prowess. The displayed the greatest prowess. The invention of this particular form of military display was ascribed by military display was ascribed by military the Fowler (d. 936). Ruexner to Henry the Fowler (d. 936). and by others to Geoffroi de Preulli blunted. Each jouster was attended by his squire, who accounts his second tions of St. Martin and St. Gregory and could alone touch him if he fell. (q.r.), the capital of Touraine, and In spite of precautions, however, the birthplace of Balzac, it is full of accidents and rough dealings were old-time memories. Pop. 73,398, not infrequent. In England the T. | Tourville, Anne Hilarion de Cotentin,

Tourgenieff, see Turgeniev, Ivan | developed about the 15th century into a military pageant, and finally was ousted by the masque. Tournefort, Joseph Pitton de (1656-

1708), a celebrated French botanist. In 1683 he was appointed assistant professor with Fagon at the Jurdin du Roi. In 1688 he was commissioned It crystollises in the hexagonal and shortly after through Holland m, and has a rhombohedral and England, in order to enrich the It also occurs massive and Jardin du Roi with the plants of those and in radiate fibrous countries. Being made (in 1692) a In colour it is generally member of the Académie des Sciences, he published Elémens de Botanique. The system of T. was an advance on those of Casalpino, Ray, and Rivinus, but has since been displaced by those of Jussieu and others. Authors had previously only grouped plants into classes; T. subdivided them into genera.

Tourneur, Cyril (1575-1626), an English dramatist, fought in the Low Countries, and died in Ireland after returning from Cecil's sorrowful expedition to Cadiz. Those competent to judge criticise his Atheist's Tragedy as sublime in style, but quite immature in plot, whereas they deem no praise too extravagant for the deeply passionate satirio Revenger's and

Tragedy. Tourniquet, an instrument for proventing hemorrhage by compressing The usual the main artery of a limb. form consists of two metallic plates, united by a thumb-screw, and a strap provided with a pad. The instrument is applied so that the pad is opposite the artery to be compressed, while the strap encircles the limb. By turning the thumb-serew the two metallic plates are gradually separated, so that the strap is drawn more tightly round the limb. A simple form of tourniquet for first-aid purposes may be contrived by tying a triangular bandage about the part, introducing a stick between limb and bandage, and twisting until the required degree of compression is ob-

11th century. Ts. were regulated by dral, in which the gradual progress of definite rules and by very strict architecture from 170 till 1547 may etiquette. The weapons used—spears, be traced. The Crearedunum and lances, swords, or daggers—had to be later the Civitas Turonorum of the later the later the later the later the Civitas Turonorum of the later the later the la Romans, the scene of the ministra-tions of St. Martin and St. Gregory

of the Dutch and Spaniards (1676). But his most famous victory was won in 1690 off Beachy Head against the Dutch and English. The enemy, however, retrieved this diseases in 1690 ever, retrieved this disaster in 1692. when T. suffered a calamitous defeat at La Hogue.

at La Hogue.
Toussaint, L'Ouverture (1743-1803),
a liberator of Haiti, was a negro and
by birth a slave. In 1791 he joined
the negro rebels, and had soon, by his
bravery and talents, established a
wide sphere of influence. Joining the
French when they abolished slavery,
he was in 1796 given control of the
forces in San Domingo, and with
them restored peace in the land. But when Napoleon tried to recover the slaves to their bondage, he took up Eventu-

part or flax or hemp separated from the finer part by the hatchel or swingle.

Tower Bridge, The, spans the Thames, London, connecting Bermondsey with the Minories. It was built between 1886 and 1894. Two slender iron bridges (200 ft.), the lower a carriage way, which lifts for the passage of large vessels, terminate at either bank in a tall Gothic tower (246 ft. high).

Tower Hamlets, a parl. bor. of E. London. The divisions are Bow and Bromley, Limehouse, Mile End, Poplar, St. George, Stepney, and Whitechapel. Pop. (1911) 442,202. and

Tower of London, an ancient stronghold on the R. Thames in the City of hold on the R. Thames in the City of London, England. Underneath have been found traces of Roman fortifications. The keep, or White Tower, was begun in 1078 under the direction of Gundulf, Bishop of Rochester, and all the other historic towers including Wakefield Tower, where the Crown jewels are kept, Beauchamp Tower, the place of confinement for so many unhappy and illustrious prisoners. unhappy and illustrious prisoners, and the Bloody Tower, where the Duke of Clarence and Edward IV.'s sons were murdered, are all of later date. The Tower is still a fortress, and contains barracks within its precincts. It was a palace until Stuart times, when royalty came to see the lions (which were part of the menagerie) fight dogs and bears. But it is most notorious as a prison to which Sir Thomas More, Cranmer, Anne Boleyn, Katherine Howard, Lady Jane Grey, Sir Walter Raleigh, Jane Grey, Sir Walter Raleigh, Sidney, and Russell were conveyed through the ominous Traitor's Gate. Consult Gower's Tower of London.

Town Council, the governing body

Count de (1642-1701), a French of a municipal borough or county admiral and marshal of France, dis-borough (see Borough). Where the tinguished himself in the battle of particular town is included in the Palermo against the combined fleets county area the county council has overriding administrative powers in certain matters; but in the case of county boroughs, the T. C. is practi-cally independent of all other local governing authorities (see Local Government). The T. C. consists of the mayor (q.v.), aldermen, and councillors. Membership of the council is restricted to persons enrolled, or entitled to be enrolled, as burgesses (q.v.). The councillors are elected for a period of three years, and one-third retire annually on Nov. 18 in each year and are eligible for re-election. Aldermen hold office for six years, one half retiring on Nov. 9 triennially. The mayor is the civic head of the borough, and presides over the T. C., and is entitled to the courtesy title of worshipful,' and may be paid a alary. The mayors of Manchester, Liverpool, Birmingham, Bristol. York, and a few other large cities or towns are Lord Mayors by letters patent. T. Cs. usually meet fort-nightly or monthly, but they are only compelled to meet once a quarter.

Towneley, Charles (1737-1805), an English art collector, who gathered together a splendid collection of sculptures, bronzes, and coins, etc., which the British Museum purchased after his death for the Græco-Roman

rooms.

Towneley Plays, The, or Wakefield Mysteries, are thirty-two in number, and are believed to have been written in the 15th century by the friars of Widkirk or Nostel. Like the York plays, etc., the various pageants together dealt with the whole Bible story. Some, like those of Noeh and the shepherds, are purely comic and the whole are remarkable for their humour and animation no less than for their coarse tone.

Town Planning. The general aim of T. P. and its connection with the narrower subject of the housing of the working classes has already been dealt with in the article Housing or THE WORKING CLASSES. Housing in the technical legal sense is a merely destructive policy mainly carried out by the machinery of closing and demolition orders; but T. P. is a constructive policy which aims at the beau idéal of towns whose every street and building shall be so constructed and correlated as to produce an hygienic, and even artistic, whole. Industry and poverty have, in practi-cally every town in England, and indeed elsewhere, conspired to an common result of hideous and squalid ugliness, redeemed only by a few exceptional instances of private

remedied in a thorough-going manner must depend on three things: Firstly, the degree of inclination on the part of local authorities, private land-owners, and industrial capitalists to co-operate in the matter of land development; secondly, the extent to which those concerned can be persuaded of the economic soundness of even the minimum demands of T. P.; and thirdly, the education of the lower classes to appreciate order and cleanliness.

It is impossible within the limits of this article to explain in detail the direction in which economies may be effected by T. P., but some realisation of the truth of the principle that loss or minry to one member of the body politic results in loss or injury to all. may not only convince landowners, house-builders, rent-payers and rate-payers that T. P. is a good 'business proposition,' but may also serve to suggest how economy in land or town 'development along T. P. lines may be effected. No doubt it is impossible under the present system—unme-thodical use of land, a building byolaw code which favours the operations of the jerry builder and speculator, and an artificially high cost of estate development — to re-organise our existing towns or town-extensions. The compensation of vested interests would in all probability entail a public would more burden which counterbalance the net advantages of rebuilding; but at least it is possible by scientific T. P. methods to prevent the continuance of waste. The basic principle of T. P. is to map out beforehand all the constituent parts of a modern town, and then to arrange them in such a way that the whole shall exhibit a uniform and ordered armony. An ideal T. P. scheme contemplates and provides for the harmony. development, as a whole, of every urban, suburban, and rural area likely to be built upon during the next thirty or fifty years (Mr. Nettlefold, Practical Housing). The future says the same authority, is divided into districts, districts are graded. High buildings close to each other are allowed in the centre and on the main arteries; in residential districts buildings must be lower and more dispersed, the further they are from the centre of the city or its main arteries. In those streets where traffic is light, and a sufficient distance is maintained between the opposite lines of houses, narrow and inexpensive roadways or drives are allowed in order to keep down the

munificence or enterprise. Whether for at least 1s. per week on a 6s. 6d. this state of things is likely to be house. Again, parks and open spaces and playgrounds are provided for beforehand, instead of waiting till the land required has risen to an exerbit-ant price; and these 'lungs' are ant price; and these 'lungs' are planned on 'back-land' and not on valuable frontage, while to factories are allocated districts on the opposite side of the town to that from which the prevailing winds come, and with analogous considerations of amenity convenience, and public health; all other classes of buildings are assigned the most suitable relative positions. There is no doubt of the importance of securing the sanction of the local authority to the construction of cheaper roads in purely residential districts, and indeed wherever heavy traffic is not likely to pass, and with that object in view, among others the Act of 1909 (section 55), allows, so far as may be necessary, the susponsion of existing byo-laws. Unless facilities for reduction of road cost are given. it seems obvious that landowners will be justified in crowding as many as fifty-six houses to the acre in order to make building operations pay. illustration of this, it is often pointed out that house rents might have been much lower in Bournville, Mr. Cad-bury's model village, had the local authority not insisted on macadamised roads where they were not necessary. One of the best examples of T. P. in the world is Cologne, which city serves as the model on which many other German cities have acted and are acting. Under the 'zone' or district' building system the whole city area of Cologne is mapped out in zones, for each of which special build. ing regulations are made, which for the most part allow of the different advantages detailed above. Some of the best English examples of T. are Port Sunlight, Mr. Recki Reckitt's garden suburb on the outskirts of Hull, Earswick, Letchworth or the Garden City, Sutton (Surrey), Hampstead, Sherborne Tenants, and Fallings Park. Not one of these fulfils all the ideals of the town-planner; in many cases the rents are too high, and some of the old evils consequent on a ' castiron byo-law system still tend to arise. Further, most of these schemes are merely praiseworthy efforts of private companies or a few individuals who have moved not with the co-operation of, but in spite of, local authorities. The objections to T. P. as summarised from Mr. Nottlefold's Practic Practic too lat ect of (some allowed in order to keep down the the subject will be found in the article cost of estate development, which in Housing of the Working Classes), modern English districts is responsible (2) That T. P. interferes with the

owners, honest builders, and the poor entailed by the present bye-law system. (3) That land speculation and jerry building will be stopped an objection that carries with it its own answer. (5) That it tends to increase the price of land available for building purposes—the answer to which objection may be gathered from the observations on the reduction of the cost of estate development above.
(6) That the give-and-take policy inherent in a system of released and suspended bye-laws will lead to corruption, which according to Mr. Nettle-fold may be checked by refusing to grant concessions without receiving concessions in return, e.g. in the matter of the number of houses per acre. (7) That as in Germany T. P. may result in the erection of huge block tenement buildings on the land immediately adjoining town-planned districts—an objection which answered by the explanation that this evil in Germany was the result of rapid and unforeseen developments after the war of 1870. Again, there are the following objections by those who prefer alternative methods of housing reform to T. P. (8) That improved means of communication and the taxation of land values will solve the housing problem without other assistance; and (9) that the only war to secure a supply of good cheap houses is to introduce the principle of municipal house-building (see MUNICIPAL TRADING). Part II. of the Housing and Town Planning Act of 1909, which is headed Town Planning, contains nothing in the shape of a definition of T. P., and there is but little detail in its very tentative provisions, and much that seems essential to even the most modified ideal is relegated to schedules and the regulations of the Local Government Board made in pursuance of the Act. If the movement for T. P. becomes successful there can be no doubt but that a separate Act will be passed in the near future embodying the experience of the past. In 1912 the the near future emboaying the experience of the past. In 1912 the urban district councils of Acton, Barnes, Beckenham, Cleckheaton, Greenford, Hayes, Coombe, Merton, Sedgley, Southall-Norwood, Surbiton, Walthamstow, and Warrington, and the corporations of Blackburn, Halifax, Kingston-on-Hull, Middlesburgh Partementh Southnort, and Stock-Croydon and Grimsby, had all pro-

liberty of the subject, to which the of 1909 that so much power has been enthusiast retaliates by pointing to vested in the central authority—the the infraction of the liberties of land-Local Government Board, and that local authorities must necessarily be fettered at every turn by a veritable jungle of statutory regulations. local authorities and landowners do local authorities and innowners do not choose to co-operate in the T. P. movement it seems unlikely that any direction by the Board to a local authority on the representation of inhabitants will be really effective. It is submitted, too, that some of the Board's subsequent regulations are ultra vires. These criticisms will be found fully elaborated by the present writer and Mr. Casson in Casson and Ridgway's Housing and Town Planning Act, 1909.

Townshend, Charles, second Viscount (1674-1738), a statesman, took an active part in supporting the Hanoverian succession, and on the succession of George I. was appointed Secretary of State for the Northern Secretary of State for the Northern Department. He lost favour with the king in 1716, and was sent to Ireland in 1717, but was soon dismissed. In 1720 he was President of the Council under Stanhope, and on Stanhope's death (1721) became again Secretary of State, which office he held until 1730.

Townshend, Charles (1725-67), a atesman, entered parliament in Townshend, Charles (1725-67), a statesman, entered parliament in 1747. He held the office of a Lord of the Admiralty for a short time in 1754-55, and was Secretary-at-War, 1751-62, and then reports. 1761-63, and then went to the Board of Trade. He became Paymaster of the Forces in 1765, and in 1766, under Chatham, Chancellor of the Ex-chequer. He was a firm advocate of the Stamp Act, which lost the Ameri-can colonies to England. He was an admirable orator, and the subject of one of Burke's most magnificent

of one of Burke's most magnificant panegyries. There is a biography, entitled Charles Townshend, Wii and Statesman, by Percy Fitzgerald, 1866.
Township, or Vill, originally a group of allodial (see Tenure) proprietors united by community of agricultural interacts, the chief officer of which interests, the chief officer of which was the town-reeve. Later the T. consisted of the tenants of some one great overlord vested with powers of local government under the supreme control of the overlord who himself nominated the reeve. Under the Norman kings the T. became a manor and formed the nucleus of the medieval borough. Each manor con-tained the demesne lands of the lord, Portsmouth, Southport, and Stock a number of freehold tenements, port, and the rural district councils of villein tenures and waste land for pasture. The term is not now in croydon and Grimsoy, had an pro-ceeded far enough to encourage the belief that they had definitely piedged themselves to proceed with schemes. It is a lamentable feature of the Act Townsville, a port and episcopal

see of Queensland. Australia, is situated on the E. coast. It is the seat of See Monographs by F. C. Montague an Anglican bishop, and possesses a (1889) and Milner (1901).

Toynbee Hall, Whitechapel, was Pop. 13,678.

Towson, John Thomas (1804-S1). an English scientist and author, first suggested the use of a reflecting camera, and showed how to take photographs on glass. In navigation he demonstrated that great circle sailing was the shortest, and also wrote a treatise on the deviation of the compass in iron ships.

Towton, a par. in the W. Riding of Yorkshire, England, 2½ m. S. of Todcaster, and the scene of the

Yorkist victory of 1461.

Towy, a river, rising in N.E. anwing 35 m. · with with

the chemical nature of poisons, their origin and preparation; their physiclogical action and the tests by means of which their presence may be detected; the pathological changes due to their presence and the recognition of them by post-mortem evidences: their chemical reactions with a view '- '-- of --- idote and to t. the he latter. Sinc Pasteur, and much more in pentics being la discovery of which may be .

chemical sense or as poisons for the bacteria. This subject views the matter as warfare between germs and the cells of living creatures, carried on largely by means of excreted poisons. The investigation tends to assume the form of research into the molecular structure of the chemical concern. See Poisons.

Toxophilite Society, Royal, was founded by Sir Ashton Lever in 1781 in order to revive the sport of archery in England. It has its shooting-ground in Regent's Park, London.

Toyama, a tn. of Hondo, Japan, 160 m. W.N.W. of Tokio, and an important trade centre. Pop. 57.437.

Toynbee, Arnold (1852-83), an English economist and social reformer, born in London. He was intended

Toynbee Hall, Whitechapel, was founded in 1884 by Canon Barnett and a group of friends, who named it in memory of Arnold Toynbee. It was the first of many settlements for improving the social conditions of the East End. It contains rooms for some

twenty resident workers. Toyokuni (1769-1825), a Japanese artist. He won great same by his coloured woodcuts: and on his death a number of his finest prints were buried along with him by some of his pupils, this strange act being regarded in Japan as a mark of exceptional homage. Concerning himself mainly with portraying actors on the stage, T. had a genius for reincarnating a momentary gesture, and in general he did this with a rare economy of line which makes his feat additionally

striking. Toys, implying in a general sense, children's playthings. T. can be traced back to very remote periods. The top is mentioned by Virgil in the seventh Eneid, and was probably introduced into England by the Romans. The Greeks appear to have played with four different kinds of ball: the little ball, the great ball, and s become the empty ball, which was blown out collection of very early Roman s in the Musée du Louvre, Paris,

rhich a description is given in that the poisons excreted by bacteria and interesting work of H. R. d'Alle-those which are antidotes, either in a inagne's Histoire des Joness (Pavis,

1903), and which deals very fully with les pouples of different periods. T. P.'s Weekly, a weekly paper founded in 1902 by Mr. T. P.O Comor, M.P. It contains able reviews in the personal as opposed to the editorial style; stories, historical sketches of celebrated personages or events; ancedotes, literary discussion, etc

Tracadie, a fishing vil. on the Gulf of St. Lawrence, 35 m. E. of Bathurst, New Brunswick, Canada. It contains a leper hospital. Pop. 2000.

Trachea, or Windpipe, the air tube which leads from the larynx to the bronchi. It is about 41 in. long, and is made up of fibro-elastic membrane encit about encle or conin. tissue

-rachea front of the esophagus irentes into the two e trachea is sometimes Cammation through the foreign bodies. In such removal of the body is with a fair amount of risk,

e danger of respiratory ob-

the betterment of industrations. In 1875 he went chapel, where he joined in '

of tracheotomy.

Tracheotomy consists of cutting into the windpipe above or below the isthmus of the thyroid gland. curved tube is inserted into the orifice. and by this means breathing is carried on. The operation is called for when the upper respiratory passages are obstructed by foreign bodies or morbid growths, as in diphtheria.

Trachonitis, a district of ancient Palestine, corresponding to the modern Leja. It lies S. of Dama-cus, E. of Aulanitis and N. of Batanea, in Bashan. In 37 A.D. Herod I., king of Judge received the tetra-cus. of Judea, received the tetrarchy of

Batanea and T. from Caligula.

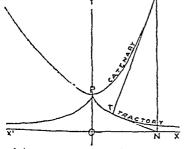
Trachyte. The Ts. form the volcanic type of the sr'

Characteristic and hornblend .

usually as sar The Ts. are named after twinning). their most conspicuous mineral, thus: sanidine T., normblemac 2., lites are leucitophyres and phonolities are trachytic rocks containing leucite and trachytic respectively. Trachytic nepheline respectively. Trachytic rocks are found in Cornwall, Haddington, Auvergne, and Hungary.

Tractarianism, a name once commonly given to the movement now better known as the Oxford or Catho-Movement, which arose about 1833 in the Church of England. was so called because its propaganda was carried on largely through the series of Tracts for the Times, of which nincty were published. See Oxford

MOVEMENT, PUSEY, etc.
Tractory, or Tractrix, the curve
traced by a heavy particle dragged
by an inelastic string attached to a



point moving in a straight line. It is represented in the figure where its evolution, the catenary is also shown. producer or the consumer. Perhaps Tangents intercepted between the the most striking institution in regard curve and the x axis are of equal to T. in the middle ages was that of

struction is usually greater if the condition be allowed to persist, removal should be attempted with every preparation being made for the operation $x_1 = x_2 + x_3 = x_4 + x_4 = x_4 + x_5 = x_4 + x_5 = x_4 + x_5 = x_4 + x_5 = x_5 =$ xx_1 , and a circle with radius equal to the tangent has an area equal to the total area included in the four branches of the curve symmetrically disposed to the axis.

Tract Societies, societies designed for the publishing and distribution of religious pamphlets and books, designed to reach the mass of the people. The Society for Promoting Christian Knowledge (q.r.) founded 1701, had this object, as had also the undenominational Society for Promoting Religious Knowledge among Poor (1750). The greatest. however, of such societies is the Religious Tract Society, founded in 1799 by the Rev. George Burder, which has proved a useful auxiliary to the various missionary societies. Its publications appear in over 250

different languages.

Trade. From about 1607 England adopted a coherent if erroneous science of commerce—the celebrated doctrine of The Balance of Trude. In accordance with this doctrine it was assumed that an excess of exports over imports was 'the sole criterion by which the relative position of the country as to wealth, should be judged,' and it was further held that the excess of the value of imports over exports could be balanced in no other way than by the importation of an equal value in gold and silver (Webequal value in gold and silver (web-ster, The Trade of the World). During the 13th century, England's foreign T consisted mainly in wool, wine, her-rings, and cloth. The ordinances of the staple were very naturally de-signed to maintain a high price for wool exported, and there was ap-pointed thus early in our compressipointed thus early in our commercial history a body of customs collectors in all the ports. Wine was mainly imported, though some was home grown: the principal object of regulation, even fifty years earlier than Edward III., was that it should be obtained by consumers on the easiest terms possible, and hence the privileges accorded to the Gascony merchants by Edward I. excited the hostility of the city of London merchants. At this period the middleman was anathema as well to the legislature as to the consumer; and ordinances were framed against 'forestalling' or 'engrossing.' But with the increasing complexity of commerce it was soon found to be impracticable to attempt to interfere with middlemen whether in the interests of the

earlier times to co-ordinate and regulate T., not only in England, but on the continent—whence, indeed, the institution was imported (see also TRADE UNIONS). The principal effect of the gilds on T. was that by regulating apprenticeship and insisting on a high quality of manufacture, they, by their own material prosperity, not only re-acted upon the growth of towns, but themselves became identified with the municipal or controlling authority, although in another direction they checked the expansion of T. by their exclusiveness. The geographical discoveries of the 15th century expanded the area of commerce, and the supersession of municipal or civic by national life gave rise to schemes for economic progress in various Euro-pean countries. The importance of these schemes lies in the fact that they opened out the way to invest-ment of capital, and by so doing introduced the only feasible antidote to the artificial restrictions on T. expansion imposed by the gilds. The principal events in the history of English T. in the reign of Elizabeth were: (1) the systematic development of English maritime power; (2) the immigration of skilled labour through Burleigh's grants of patents for new enterprises, and the consequent introduction of new industries by capitalists; (3) the establishment of plantations abroad notably in America; and (4) the introduction of banking and insurance. Another ig-nificant feature of the changing times was the fact that capital was sunk in land, so as to make it commercially profitable, whereas previously tillage was practised for subsistence, not for profit. The differentiation between employer and employed, notably in the spinning T. of the west of England, was the direct outcome of the fact that the capitalist employer was in a superior ing workme . saving device profitable me ascendancy under political their directly encouraged the Walpole

introduction of non-indigenous Ts., but the domestic system offered but little in the way of a solution of the cardinal difficulty—the dearth of materials in the actaliable. materials in the established manu-factures. Capital everywhere promoted T. by finding the necessary materials, fostering skilled immigrant labour, and making a market. Per-haps the revolt and severance of the American colonies was the best conccivable antidote to the short-sightedness of the British commercial system,

the craft-gilds, an institution which for that system was fashioned solely did more than any other during these in the interests of English industry, and conversely hampered and repressed colonial industries in every direction (see on this Cunningham, section xvii., subject, Mercantile System). Then came the industrial revolution in the shape of the introduction for the table to the converse of the introduction of the table to the converse of the c duction first in the textile and then in the other Ts. of machinery, and as a corollary, the rise of factories and the wage-carning class; and it is only in more recent years that the negative philosophy of this great capitalist system of T.—the doctrine of laissez faire-which came as a reaction from the protectionist principles of the early part of the 19th century, has been seriously called into question (see on this FACTORY AND WORKSHOPS ACTS; LIBERALISM). For British commercial policy during the last hundred years, see under FREE TRADE; PROTECTION; TARIFF; and Tariff Reform; and for the most recent statistics of British foreign recent statistics of British foreign trade, see under MERCANTILE MARINE.
Trade, Board of. This office was the lineal successor of the old Privy Council Committee of Trade and Plantations, which in its turn was the successor in 1695 of the two old councils of Trade and Foreign Plantations of Trade tions created by Charles II. in 1660. The committee or B. of T. and Plantations, according to Sir William Anson, was an inefficient body which became an expensive machine for making inquiries which were seldom made, and for having in readiness advice which was seldom asked for.' It was dissolved in 1786 and replaced by a body on the basis of the present B. of T., the name 'B. of T.' not being given to the department till 1862. It is still theoretically a committee of the Privy Council. Its principal duties are: (1) To collect statistics of foreign, home, and colonial trade; (2) To settle and approve bylaws of

railway companies, and generally to regulate railways and tramway comniles; (3) To control in the interests public safety all gas, electricity, ad water companies; (4) to collect bour statistics and generally investigate the conditions of labour in the United Kingdom (see also Labour Exchanges); (5) to register joint stock companies; (6) to superintend the grant and registration of patents, trade marks, designs; (7) to maintain harbours and lighthouses; (8) to control merchant shipping (see Merchant Shipping); and (9) to investigate through official receivers, the conduct of bankrupt debtors.

Trade Corporation, see CORPORA-

Trade Marks. The Trade Mark Act, 1905, defines a T. M. as a mark

pose of indicating that they are the goods of the proprietor of such T. M. by virtue of manufacture, selection, certification, dealing with, or offering for sale 'and includes in the term 'mark' a' device, brand, heading, label, ticket, name, signature, word, letter, numeral, or any combination thereof. A T. M. is not, like a design, a species of incorporeal property in which a man can obtain copyright, but its practical effect is the same as soon as it is applied to the goods he sells, for, assuming the mark to be distinctive, a rival trader could at once be re-strained by injunction from applying a similar mark to his goods upon the broad ground that he would thereby be inducing purchasers to think that his goods were those of another person. In short, a T. M. denotes the producer of a thing, and not the thing produced, and in that respect differs from a 'trade name,' the object of which, being in reality an advertisement of the character and quality of the goods, may be attained by describing either maker or article or both. To be valid as a T. M., the mark chosen need not have any meaning, but whatever it is, it must be distinctive in the sense that it is adapted to distinguish the goods of the proprietor of the mark from those of other traders before it will be registered by the Registrar. (The Registrar's address is: The Registrar, Patent Office, Trade Marks Branch, 25 Southampton Buildings, London.)
No mark will be registered unless it contains at least one of the following 'essential particulars': 1. The name of a company, individual, or firm represented in a special or particular manner (called 'name marks'). But one trader cannot by virtue of registration under the Act of 1905, obtain the right to prevent another trader honestly describing his own goods by his own name. 2. The signature of the applicant for registration or some predecessor in his business. It is highly inadvisable from a commercial point of view to adopt a signature T. M. Ordinary customers can hardly read or remember them, and, moreover, they afford little protection against traders with similar initials. 3. An invented word or words (called 'word marks '). word or words (called 'word marks').

These are very popular as T. M., for in the words of a high authority, 'While in many of the classes all, or almost all, the sultable devices are either already appropriated or have ceased to be distinctive, the number of new words which may be invented is practically unlimited '(Mr. Kerby).

Under the old Trade Marks Act of might be injurious to trade, and

used, or proposed to be used, upon or 1883, word marks were defined as in connection with goods, for the pur- 'a fancy word or words not in common use,' and so severely was this definition construed that 'Gem' as applied to a gun was held not registerable. That Act still governs old marks or T. M. registered at that date, but not new marks under the Act of 1905. 4. A word or words having no direct reference to the character or quality of the goods, and not being according to its ordinary signification a geographical name or surname. Under the analogous clause in the old Act, Appollinaris as applied to mineral waters, Uneeda to biscuits, Hamatogen to medicine were held to be such as had reference to character or quality. Kynile for explosives, Trilby for blouses, and Mazavatlee for tea were held to have no reference to character or quality and therefore to character or quality and therefore to be within the protection of the clause. The whole object of the drafting of the clause in so guarded a manner is to prevent ordinary English words from being registered so as to deprive the public from employing them in their ordinary meaning. 5. Any other distinctive mark, but a other than such as fall within the descriptions in 1, 2, 3 and 4 (supra) shall not, except by order of the Board of Trade or the court, be deemed a distinctive mark. But any deemed a distinctive mark. But any special or distinctive word, letters, etc., used as a T. M. by the applicant or his business reador his business-predecessors prior to Aug. 13, 1875, which has continued in use without substantial alteration use without substantial alteration down to the date of the application for registration will be registered under the Act of 1905 (i.e. irrespective of its failing to satisfy any of the 'essential particulars' above noted). T. M. must be affixed in some way to the articles sold and the act of the articles and arms, 'trade arms,' thus again differs from a 'trade name (which must not be confused with a name mark'). In case of infringement, the injured party may choose between damages or having an account taken of profits. Registration is a condition precedent to the right to sue. In regard to trade names the law merely recognises a person's right to prevent others from personating his business by using any such description as would lead customers to confuse his goods with those of a trade rival.

generally of assisting the commercial armoury—a fact which was remarkcommittee. Over 100 societies, representative of all branches of manufactures and trade, are affiliated to the association.

Traders' Defence Associations. These associations, which exist both in England and Scotland, were founded with the object of defending the inof municipal bodies.

Tradescant, John naturalist, is most prob

of A vorag of umbusad,

for 1

the earliest account ext plants. He took part in the expedition against the Algerine pirates (1620), and brought back the 'Algier apricot.' His son, John Tradescant (1608-82), made a collection of flowers, plants, and shells, which he bestowed on Elias Ashmole, who presented it to Oxford University (1682). He pub-lished Museum Tradescantianum, 1656. He introduced, with his father, the lilac, acacia, and occidental plane.

Tradescantia, or Spider Wort, a genus of herbaceous plants (order Commelinaceae), hearing cymes of red or blue flowers. They are frequently grown under glass.

Trade Unions. The object of T. U. is simply the substitution between

A modern of workmen

the ' of la ing ticular industry. The secondary function of a T. U., and that by exclusive reference to which the jealousy of legal theory for years recognised its existence, is to act as a benefit club or assurance company. Every member is bound by the rules to contribute a fixed weekly sum to the funds, from which, in case of illness or loss of employment, he obtains assistance, or in the event of death his depend-

may that T. U. have been so powerful in recent did not work to order, but simply years, and the parliament of 1906 saw took their products to the central the election of some fift rears, and the parameter of 1 solvest with election of some fift for sale and waited for members, nearly all of w purely T. U. representative crease of political power, though it may be by th judgment (see below), has greatly employ workers who had never served and apprenticeship, besides women and —the chief weapon of a union's children (the latter at an earlier ago

community. The affairs of the asso-ably emphasised during the great coation are managed by an elective railway and transport strikes of 1911, when the ministry found themselves forced to treat directly with the men's representatives.

Origin of trade unions.—Despite great controversy, there can be little doubt of the accuracy of Brentane's view that T. U. were the successors of the craft-gilds, and more especially terests of private traders or com- of the English gilds. The latter were panies against (1) governmental and organised associations of free handimunicipal interference in the form of craftsmen, which existed for the purburdensome taxation, oppressive inpose of protecting the members spection, etc.. and (2) the trading accordant the abuse of power on the part tivities of co-operative societies; and of the lords of towns, who endeavoured by imposts and otherwise (d. 1637), a to encroach on the freeman's earnings "e him to the dependence It is true that the craft-

there deteriorated into mere societies for the investment of capital, or became identified with the municipal authority of a borough; but it seems almost indisputably proved by Brentano that the T. U. originated with the non-abservance by master manufacturers of the regulations of the Statute of Apprentices (5 Eliz. c. 4), which regulations, expressly designed to ensure 'good quality of work' by craftsmen, indirectly resulted in rendering the position of the latter eminently secure. Shortly, that statute forhade any one to practice either as master or journeyman any 'art, mystery, or manual occupation' unless he had been apprenticed therein for seven years whoever had three apprentices must keep one journeyman, and for every other apprentice above three, one 'ourneyman; the hours of

re fixed to about twelve in and from dawn till night in i); and wages were to be The secondary assessed yearly by the justices of the peace, which same authorities were to settle all disputes between masters and apprentices, and to protect the to appronlatter. · competitices 1 in the tion maintenance of a high degree of skill. while great stability and regularity of employment was assured to both apprentice and journeyman. Moreover, slackness of trade, at all events in the woollen industries, did not stop

work in the workshops, for the masters

of old customs and laws soon brought distress on the weavers, and led them in 1796 to form a trade society, the 'Institution,' as it was called, among the Halifax cloth workers, the object of which was to prevent any one from carrying on the trade contrary to law and custom, and to assist sick mem-The same evolution is observable in the case of the frameworkknitters, the Spitalfields silk-weavers, the hatters, calico printers, and others, all of whom, at various times in the course of the 18th and 19th centuries, combined, as soon as attempts were made to break up the old order of things.

Trade unions and the legislature.— The rise of the mere capitalist-employer as distinct from the master-manufacturer had two results: (1) the definite estrangement of employer and workman; (2) the depression of wages all round as a consequence of over-production. The 'workers,' becoming mere automata; knowing nothing but a single process, where before they could produce the whole manufactured article; in constant danger of starvation through the introduction of labour-saving machinery, frequently gave themselves over to furious rioting. The more orderly elements combined, and by the lever of strikes endeavoured to obtain better terms of employment. The result of these combinations was the Combination Laws (q.v.), the one-sided nature of which was in no way palliated by the assumption that the underlying principle of rendering illegal any agreement in restraint of trade (see RESTRAINT OF TRADE) applied equally to combinations of

masters as to those of men.

The repeal of the Combination
Laws in 1824 left the 'workers' free
to enter into T. U., and since that
Fear unions have been formed in most of the great manufacturing towns, where the concentration of members has given them formidable influence and ample funds (see chap. xi. of Burnley's Romance of Modern Industry). The legalisation of T. U. per se, irrespective of their tendencies in restraint of trade, naturally led to abuses. Picketing, intimidation, and incen-diarism, directed against both blacklegs' and employers, were so frequently resorted to that parliament in 1875 passed the Conspiracy and Protection of Property Act, which punishes by fine or imprisonment (1) such acts as hiding tools, using violence to a man or his wife or clear that the latter, when prices rise children, besetting his house, and per- as a result of the coercive action of sistently following him about; and T. U., will cut down his purchases to

than would have been possible with- (2) the wilful and malicious breach of out machinery), at a much lower rate contract of service so as to cause a of wages than the men. This violation failure of gas or water or danger to One concession was made to life. T. U. in this Act in the clause which allows that trade disputes shall form an exception to the general criminal law of conspiracy (see Conspiracy). This immunity from criminal responsibility, however, still left the unions liable to civil actions for damage done by their agents, whether in the shape of conspiratorial acts or otherwise, a responsibility fully exemplified in such causes célèbres as Quinn v. Leathem, Allen v. Flood, and the Taff Vale case, in which last case it was decided that the funds of a T. U. could be attached to answer damages awarded against the union. This state of the law led to the passing of the Trades Disputes Act, 1906, which in some four sections placed T. U. in a position of legal immunity which no other association of individuals has ever enjoyed before or since. The unique legal immunities gained by T. U. in 1906 were however, largely counterbalanced counterbalanced by the set-back in political power involved in the decision in case of Osborne v. the Amalgamated Society of Railway Servants (1908). In that case the court of appeal, overruling Mr. Justice Neville, held that a T. U. could neither allocate its funds to, nor make a levy for, political purposes, and that its lawful activities related exclusively to industrial matters. Since that decision the Labour Party, after repeated efforts, secured in 1913 the passing of an Act partially reversing the judgment. The Trade Unions (No. 2) Act provides that a T. U. may apply a portion of its funds to political purposes, on condition that the majority of the members approve thereof, and that the political and ordinary funds be kept separate. and that those unwilling to contribute to the political fund shall not be com-pelled to do so.

Economic effects of trade unionism. —It is beyond controversy that the machinery of a T. U. cannot increase the rate of wages by depressing the profits of capital, for it is an economic commonplace that such profits, i.e. terest on advances, are in a manner a fixed quantity. The greater the insecurity of these profits, the higher will be the rate payable to the employer as compensation for the contingency of loss. Moreover, with but one exception, that of agricultural industries, the struggle is not between labour and capital, but between the labourer and the consumer: and it is

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considered, because experience shows that the difficulty of combination among agricultural labourers, observable in the infancy of T. U., continues to the present day, and in any case the rapid improvements in agricultural machinery would have quickly nullified any effect an agricultural union might have had. Again, the Again, the effect of a successful combination to raise wages in those industries which manufacture goods capable of im-portation will not raise prices beyond the amount at which the importers can afford to sell, while as to goods unionists have begun to appreciate which cannot be imported, it has been our reduces its indicated above that a rise in price can be continued only so long as the consumer abstains from economising his purchases. The net effect of the interference of T. U. has probably been to augment prices without in any way decreasing the profits of employers. Furthermore, there is considerable justification for the assumption that T. U. are a machinery by which 10 per cent. of the working classes combine to rob the remaining 90 per cent., in the economic axiom that the wages fund is a certain quantity; while there is even greater force in the argument that a general rise in prices, unaccompanied by a corresponding rise in wages, hits the trade unionist as hard as any other

been a rise in prices unaccompanied and the C by any increase in the cost of pro- Unions at

is in no way inconsistent with 1912, is in no way inconsistent with the foregoing statements, inasmuch as the flexibility of wages is tacitly assumed by the omission in the Act of specific figures.

Trade union statistics.—At the end of 1912 there were over 1100 unions, with an aggregate membership of a bout 3,000,000. The number affiliated to the Trades Union Congress in 1913 was 2,232,446. The increase in membership for the decade 1900-10 was unionists are affiliated. The national about 250,000. The large increase of body of the U.S.A., the American

the lowest possible limit of subsistence. In the excepted case of agriculture the loss accruing from a rise in wages would ultimately fall not on the farmers but on the landlords, who is sufficiently indicated by the But even so agriculture need not be fact that the latter still number less than 10 per cent, of the whole, and than 10 per cent. of the whole, and even these are for the most part cotton or other textile operatives. The aggregate funds of all the principal unions increased from four to five millions sterling during the same period, but the heavy drain on their resources in 1911 has probably brought this total down by at least threequarters of a million.

Amalgamation and syndicalism.— The outstanding feature of T. U. development in recent years is the move-ment towards amalgamation. Many

. that the most s not by parwhole industries. Up to now, however, the general body of unionists have, with a few striking exceptions, notably among the railwaymen, not fayoured the proposals for amalgamation of different sections, proposals which, if adopted, might well be a first step in the direction of Mr. Belfort Bax's con-

٠ ٧q٠ Religion of Socialism, 1896). If. as is probable, such a fusion fell short of any such visionary ideal, it would certainly help the aims of Syndicalism (q.v.).

Trade union organisations.—The chief executive body of the trade unionist movement in England and Wales is the Parliamentary Committee of the Trades Union Congress. Scotland and Ireland have separate T. U. congresses. The Labour Party

world in the number of trade timon ists, has recently yielded place to Germany, the chief national organi-sation for that country being the General Commission of the German T. U. formed in 1890. Herr Karl Legien, president of that body, is secretary of the secretariat of the International Trades Union Movement, to which nineteen countries with more than 7,000,000 trade Federation of Labour, has about 2,000,000 members, and the French T. U. movement is represented by the smaller but active Confederation

Générale du Travail.

Trade Winds, the currents of air on the earth's surface travelling from the high pressure belt of the tropics to the low pressure of the equatorial belt. Owing to the eastward rotation of the earth, they have a westward lag. In the N. hemisphere they are lag. In the N. hemisphere they are N.E., in the S. hemisphere S.E. winds. In March the positions are: N.E. (Atlantic) 3°.26° N.; (Pacific) 5°.26° N.; S.E. (Atlantic) 0°.25° S.; (Pacific) 3°-28° S. In September, N.E. (Atlantic) 11°-35° N.; (Pacific) 10°-30° N.; S.E. (Atlantic) 3°-25° S.; (Pacific) 7°-20° S. From March to July each belt swings northwards; from September to January southward. tember to January southward. Lying in regions where rotational velosity increases only slightly towards the equator, and travelling from a restricted to more extended areas, they tend to curve westwards only slightly and are of a mild nature, with an absence of vortices or cyclones. Their steadiness of strength and direction led to the pages trade (trend) tion led to the name trade (trend). The configuration of land and water leads to greater curvature and a general formation of great anticyclones, of which the trades form the equatorial half. Towards the W. of the oceans they become more westerly and impinge on the E. coasts of continents, giving satisfactory rainfall. At their origin they are dry, fresh, gentle breezes, but they gradually become damp and stronger, cumulus cloud of characteristic nature forming. The regions are marked by little rainfall and greater salinity over the ocean; the corresponding land regions tending to desert conditions.

Anti-trades are the return currents from the equator travelling above the trade winds and towards the N.E. They are in part the source of the westerlies or the relativistics of the the westerlies on the polar sides of the tropleal calms; the term is some-times erroneously applied to these surface winds. Reversed trades occur particularly in the Indian Ocean during the summer, when they form the S.W. monsoons. They succeed in dragging 'the S.E. trades across the equator, the doldrums thus not occurring.

Traducianism, the theory that souls are propagated in a similar way to the procreation of the body. See Tertullian's treatise Defanima.

Traislagr, the name of a cape on the S. coast of Spain between Cadiz and Tarifa, and the scene of the great naval victory of the English fleet under Lord Nelson over the combined French and Spanish fleets under been moored together.

Villeneuve on Oct. 21, 1805. This battle shattered the power of France natice shattered the power of France and Spain at sea at a time when Napoleon had made himself master of Europe and protector of the Confederation of the Rhine. Nelson, after the close of the Danish War in 1801 and his unsuccessful attack on the preparations at Boulogne for the invasion of England, had retired to his estate at Merton, and apparently for good. But the short peace of Amiens was soon dissolved, and Nelson was called upon to resume the command of the Mediterranean fleet (1803). During the winter of 1804 he watched Toulon harbour, where the French were preparing to embark a large body of troops for some unknown Nelson sailed for Bardestination. celona to draw them out, and in his absence Villeneuve with ten ships-ofthe-line and many frigates put to sea une-me and many frigates put to sea (Jan. 18, 1805). Nelson, believing Villeneuve to be going to Egypt, himself sailed for Sicily, but Villeneuve had passed the Straits of Gibraltar and effected a junction with the Spanish fleet at Cadiz. Nelson, on learning this, chased Villeneuve to the W. Indies, whence the French, in terror of his name. returned without terror of his name, returned without accomplishing anything. Nelson returned in pursuit, but learning that the enemy had arrived at Cadiz, he returned to England, but immediately volunteered his services again, which, of course, were readily accepted, and joined Collingwood's squadron off Cadiz (Sept. 29). in October Nelson received information from which he concluded the enemy would soon put to sea, and having on Oct. 4 laid before his admirals and captains a simple mode of attack, he disposed his fleet in such a manner as to tempt the enemy to come out. The Euryalus frigate kept watch within half a mile of the harbour mouth; eight sail of the-line were kept at a still greater distance; Nelson, on the *Victory*, remained of Cape St. Mary with the rest of his fleet of twenty-seven sail-of-the-line and four friends the sail of the-line and four frigates, the frigates extending in a line of communication between him and the seven or eight ships off or near Cadiz. The enemy put to sea on the 19th. The last order given by Nelson, who displayed on this occasion all his wonted animation and The enemy put to confidence, was the historic utterance: England expects every man this day to do his duty. Perhaps the most remarkable phase of the battle itself was the desperate struggle between the Victory and Teméraire on the one side and the Redoubtable and the Fougeux on the other, the four ships forming 'as compact a tier as if they had It was a

shot from the cross-trees of the Re- a general higher education as well as doubtable, that killed Nelson, the imparting specific pedagogical in-The British loss was 450 1250 wounded. Nineteen killed and 1250 wounded. of the enemy's fleet (which had comthirty-three sail-of-the-line and seven me up. The present and one blown up. The result of the England chance of an invasion and paved the way for the ultimate success of the Anglo-Russian treaty to resist the encroachments of France and to secure the independence of Europe.

Tragacanth, or Gum Dragon, a gum derived from various plants, but principally from Astragalus verus; a low leguminous thorny bush with pinnate leaves and axillary clusters of yellow flowers, native of Asia Minor. The gum is used in the arts

and in pharmacy.

Tragedy, see DRAMA.

Tragopan, a genus of gallinaceous birds with a crested head and a hornlike carbuncle behind each eye and a distensible wattle under the bill. The plumage is greyish-brown speckled with scarlet and black spots. Five species occur in Asia, and their introduction into Britain has been recommended.

Traherne, Thomas (c. 1637-74), an English writer, a native of Hereford. He was the author of Roman Forgeries (1673), Christian Ethics (1675), and A Serious and Patheticall Contemplation of the Mercies of God (1699), besides poems published in 1906, edited

by Dobell.

Traill, Henry Duff (1842-1900), an English author and journalist, born at Blackheath. He was called to the bar in 1869, but devoted his spare time to literature, and in 1873 he became a contributor to the Pall Mall Gazette. From 1880-95 he

staff of St. James's Gazette,

the same period Saturday Review. wrote 101 He was also the chief political leader-writer on the Daily Telegraph (1882-97). In 1897 Daily Telegraph (1882-97). In 1897 he became first editor of Lilerature, he became first cultor of Sir John and has published: Life of Sir John Franklin. 1896; Number Twenty, Franklin, 1896; Number Twenty, 1892; The New Fiction, 1897 (collections of essays); and The New Lucian (a series of 'Dialogues of the Dead ').

Training, see MILITIA.
Training, see ATHLETICS, GYMNASTICS, PHYSICAL TRAINING, ROWING.
Training Colleges, or Normal Normal

Schools, are institutions for instructing young teachers in the principles of their profession. The function of of their profession. The function of T. C. in the United Kingdom is really two-fold, as the colleges aim at giving should be at the disposal of qualified

doubtable that killed Nelson, the imparting specific pedagogical inmusket-ball entering the epaulet on struction. The necessity for such instruction, and lodging in the muscles of the 16th century by Richard Mutthe back. The British loss was 450 caster, an English schoolmaster. The education of the young was too often left to persons who had failed in other professions, or who wished to earn a living while waiting for better opportunities. The same danger to educational efficiency was felt as late as the beginning of the 19th century, and is not wholly absent at the present day. Lancaster and Bell both employed the expedient of training teachers by the monitorial system, in which young people still under instruction helped to teach those still younger. In their efforts to establish a well-organised elementary school system, Boll and Lancaster diverged on the question of religion. In 1808 the Royal Lancasterian Society, afterwards called the British and Foreign School School Society, was formed with distinct Nonconformist tendencies. In 1809 Bell's followers founded the National Society for Promoting the Educa-tion of the Poor in the Principles of the Established Church throughout England and Wales. From these two societies sprang a system of elemen-tary schools and, later on, a number of T. C. In 1839 the British and Foreign School Society College at Battersea was founded, and in 1842 the National Society established one at Borough Road. In 1843 government aid was granted in the matter of building T. C.; the British and Foreign School Society founded Swansea. culleges Stockwell, and Bangor, Darlington, Saffron Walden; while the Established Church responded with diocesan colleges throughout the country. Meanwhile, the rise of colleges of university rank at various provincial centres led to the establishment of day T. C. in rewith. Other religious founded colleges with

tho i a certam an the Wesleva (1849) and qualification for entrance to these colleges was success in passing the King's Scholarship Examination, latterly known as the Preliminary Examination for the Elementary Teacher's Certificate, or one of a number of ex

as equivalent; colleges also the nature of test was parti

when increased government ald was accompanied by a demand that at least half of the accommodation provided by denominational colleges opinion. Latterly, T. C. have been founded by county councils and other secular bodies, so that the religious difficulty promises to be a

diminishing quantity.

Trajan (Marcus Ulpius Nerva Trajanus) (c. 53-117 A.D.), a Roman emperor, born at Italica, near Seville. He received a rigorous military training from his father and gained further experience in the East and in Germany, where he served with distinction. He was in consequence made consul in 91, and at the close of 97 was adopted by the Emperor Nerva, who gave him the rank of Cesar, and nominated him as his successor. In 101 T., who had succeeded to the throne in 98 on the death of Nerva, set out on his campaign against the Dacians. This occupied him some three years, at the end of which Decebalus sued for peace and T. returned in triumph to Rome. In 114 the emperor left Rome to make war on the Armenians and the Par-thians, and in the course of two campaigns he conquered the greater part of the Parthian empire, and took the Parthian capital of Ctesiphon. In 116 he descended the Tigris and enteredt he Erythrean Sea, but in his absence the Parthians rose against the Romans, and he was forced to return. Besides his military exploits he constructed several great roads, built libraries (e.g. Ulpia Bibliotheca), and a theatre in the Campus Martius.

Tralee, a co. tn. and seaport of Kerry, Ireland, 4 m. N.W. of Ardfert. Trades in butter and exports grain. Pop. (1911) 10,300. It is situated at the head of Tralee Bay, which has a length of 15 m., and a maximum breadth of 7 m.

Tralleborg, a tn. of Malniöhus gov., Sweden, on the S. coast, 15 m. S.S.E. of Malmö. Just W. of the town a submarine cable runs W. of Rügen Is., Germany. Pop. 9909.
Trammel-net, see Fisheries, Sea.

Tramontano, a wind blowing along the shores of the Adriatic, of a fresh.

northerly nature.

Tramps, see VAGRANTS.
Tramways. By the Tramways Act,
1870, any town council (q.v.), county council, or company can construct T. provided they obtain the necessary powers under a private Act of Parliament or a provisional order (q.v.) of the Board of Trade confirmed by

students without regard to religious when the T. are proposed to be constructed in more than one district, the Board of Trade can dispense with such consent if the sanction of councils representing districts through which at least two-thirds of the T. will be laid is obtained by the company. Before granting a provisional order Board of Trade generally holds a local inquiry. Similarly, Parliament will not allow a private Bill to be intro-duced until the consent of the local authorities concerned has been obtained. A local council may, at the expiration of twenty-one years after the grant to a company of the power to construct a T., purchase so much of the undertaking with the approval of the Board of Trade, as is within their district, or after the expiration of six months from the opening of the T. acquire it by agreement. Neither under the Tramway Act of 1870 nor under an order has a council power to work a T., and they must lease them to a company in default of being vested with special statutory powers to run the undertaking themselves. county, municipal borough, or urban district council can obtain from the Light Railway Commissioners power to construct a light railway, i.e. a tramway worked by steam or electric power upon the public highways (Light Railways Act, 1896). Iron rails for T. principally for use at collieries were first introduced by

James Outram, an engineer, in 1776, at the Duke of Norfolk's colliery at Other works were soon Sheffield. carried out by Outram in many parts of the country, and they were called 'Outram ways,' and it is said that the first portion of the word was omitted and the word 'tramway' adopted. Passenger Ts. were first introduced in America in 1832, and were laid down between New York and Harlem. A system which spread rapidly in America was the grooved rail, the invention of a Frenchman named Loubat about 1852. These rails were fixed to longitudinal wooden sleepers. The groove was, however, found to be dangerous for wheel traffic and a stepped rail was adopted, and these are still largely used in America. The first T. in Great Britain was laid down in Birkenhead by Francis Train in 1860. He used the step rail, but this was dangerous and inconvenient for the traffic and the grooved rail was substituted. Liverpool then became the Parliament. An application by a council for a provisional order must be authorised by a resolution at a menced in 1868. The rail, a flat special meeting attended by two grooved one, was fixed to longitudinal thirds of the members. When a comtimber sleepers with the bars laid on thirds of the members. When a com-pany apply the consent of the local a concrete bed. It was found, how-district council is necessary, though, ever, to be dangerous and unreliable

obviate this various devices in the form of chairs and other built-up systems were adopted. Charles Burn invented, in 1860, a girder rail, which had the groove planed out after rolling, entailing enormous expense in the production of the rail. Owing to this it was very little adopted. In 1879 an improvement was effected and patented by John Kerr, who produced a girder rail with the groove rolled at the same time, thus materially lessening the cost. This rail was first used at Ipswich and afterwards at Woolwich, Wigan, and Gateshead. This form of rail has proved very satisfactory and is now the type of rail generally adopted. The fishplates were originally too large to fit in to the web of the rail closely, but now they are fixed flush with the web. The latest form of joint is the welded joint. Cars propelled by electricity were first introduced in 1835. Many systems of taking the current were devised, some having a third rail alongside the track as a conductor rail. The Portrush and Giant's Causeway electric T., 1883, was the first T. in the United Kingdom to take current from a con-ductor. The first T. to carry the public in America was constructed in 1884 at Providence, Rhode Is. The cable system of T. was adopted largely in America, and the success in its working led to several systems being constructed in England, Birmingham (central), Edinburgh (northern), Brixton (now electric conduit system), Douglas (Isle of Man), and Matlock. The cable T. at Highgate Hill was the first one of its kind in this country, having been opened in 1884; it was only running for ten years. Birmingham and Edinburgh systems were both opened in 1888. The only remaining system of this kind of T. in this country to-day is that at Edinburgh, all the others having been superseded. It is said that to construct a double-track system for a three minutes' service costs £20,000 per m.

There are two systems by which the current is delivered to the cars. the more general system the In the more general system the power is distributed to the system with a pressure of 550 volts at the generator terminals. This gives a pressure of 500 volts at any part of the trolley wire, and the cars are worked by a continuous current. In the other system the are worked by a continuous current. In the other system the 7 in. high. The conductors are two
power is distributed at a high voltage
in the three-phase form. It is then
transmitted through three-core paper
insulated lead-covered cables to substations situated at convenient points

as the rails were liable to shift on the along the T. route. These sub-timber and become loose. To stations are equipped with motor-These subgenerators which transform the high pressure three-phase power into a continuous current of about 500 volts. This system is called the alternating system.

There are three systems of electric T.: (1) The overhead trolley system; (2) the conduit system; (3) the surface contact system.

(1) The overhead trolley system -This system was largely adopted in America. In this country, however, great difficulty was experienced in getting permission to creet the overhead wires. However, Leeds con-structed the Roundhay line in 1891 on this principle. Part of the S. Staffordshire T. were also converted to the system, and since then the overhead trolley has been generally adopted. A copper conductor is generally supported on insulators at a height of about 20 ft. from the ground by steel transverse wires stretching from poles on either side of the road, or direct by the insulators on to arms stretched on either side of one central pole between the tracks. This copper-wire conductor tracks. This copper-wire conductors conveys the electricity from the substation to the tramear. The tramear is supplied with a trolley pole, having a wheel or bow at the upper end next the copper wire. This wheel collects the power and convoys it to the motors and other apparatus of control on the car. The power, after it has passed through the motors on the car, is conducted to the wheels and then to the rails. Each rail is bonded to the other by means of copper wires and form a conductor along which the power is convoyed to the sub-station.

(2) The conduit system—This is the system that has been favoured mostly by London and Bournemouth. The London County Council system is the largest of its kind in the world and the most modern. Many examples are also to l and Europe

are situate. midway between the two rails of cach track, and the current is conveyed to the cars by means of a plough which passes through a slot in the road and isslsofastened to the car. The London County Council's system has the slot rail formed of Z-section rails bolted at intervals to heavy cast-fron yokes, the width of the slot being in. The slot rail weighs 60 lbs. per yd. and is of the yokes, which are bedded in concrete, is 1 ft. 11 in. from the surface.

(3) The surface contact system. Although many surface contact systems have been invented, only very few have been put into practice, and then only with questionable success, as they appear to be more or less unreliable. This system consists of contact studs, which are placed about 15 ft. apart along the centre portion of the track from which skates' collect the current for the car propulsion. The systems at present working successfully are those at Wolverhampton, constructed on the 'Lorain' principle, and at Lincoln, constructed on the 'G. B.' (Griffiths-Bedell) system. The 'Lorain' principle is worked as follows. It consists of two main parts: (1) The insulating material of stone, and (2) a metallic cover. When a car is passing over a stud the magnets on the car magnetise the iron cover. The armature in the slot is raised by the magnetic influence and thus brings the carbon contacts together and in turn delivers the current to the car motors by means of the collecting shoe or 'skate.' The G. B.'system is worked as follows: the current is conveyed from the generating station by means of a bare stranded galvanised iron cable carried on insulators in a 5-in. stoneware pipe which acts as a condult. The contact plates consist of T-iron bedded with bitumen in solid granite. The stem of the contact pro-jects downward into the conduit. The lower end is slotted out, and in it a sliding switch is supported, by wire and slides, between copper faces. in the fork formed in the switch. Contact is secured at the lower end of the switch by means of copper clips, connected with the stem flexible copper leads. Connect Connection with the conductor and contact stud is effected by powerful magnets on the car, working as follows: As the car passes over the contact stud the stem of the contact is magnetised and the plunger switch, which has a car-bon contact, moves downward to-wards the cable conductor and im-mediately makes a contact with this conductor. The current then passes to the contact plate and is conducted through the collecting skate on the car to the motors. When the car leaves the stud the plunger switch is disconnected from the stud means of a powerful spring, withdrawing the carbon contact, and the current is immediately out off from the stud. In some cases the stud is

face contact is 3½ in. in depth. The still 'alive' after the car has passed conduit has a depth of 1 ft. 9½ in. from and to overcome this difficulty extra the top of the slot rail, and the base 'skates' are sometimes provided on the cars, which trail after the collecting skate and short-circuits the live stud with the track rail. This system was laid down by the London County Council in the East End of London, but was afterwards removed.

costs Comparative of tramuan sustems .- Under normal conditions and excluding cable work and other items, which are common to all systems, the cost of track per mile averages out at about the following figures: Conduit system, £17,000; 'G. B.' system, £11,000; overhead trolley system, £10,000.

Railless trolley traction.—This form of traction is at present in its infancy in England, though it has met with success in Austria, Hungary, France, and Italy. The cars are run on the ordinary roads by means of double-trolley wires. Two systems are in vogue at present, the flexible system and the pole system. The first uses a truck-like collector of the current, having four grooved wheels, two on the positive and two on the negative wires. The pole system is similar to that on the electric overhead system. though, of course, two poles and two wires are needed to obtain a 'return. A recent Board of Trade return shows that the T. in the country now have a mileage of 2637 route m., 1777 of which are owned by local authorities. The total capital expenditure amounts to £52,500,000, representing 172 undertakings. In the year 1911-12 the number of passengers carried represented sixty-nine times the whole population. The nett receipts amounted to £4,250,000, nearly £500,000 of which was paid in relief of the rates. The capital expenditure amounted to £13,623 per m. of single track for track and works only, but the total cost was £18,005, including all items in the construction. н. Professor R. Smith. Electric Traction; Wilson and Lydall, Elec-trical Traction; Ashe and Kelly, Electric Railways; W. R. Bowker, The Practical Construction of Electric Tramways.

Trance (Lat. transire, to cross over), a term somewhat loosely applied to many abnormal states of consciousness, particularly to sleep of a cata-leptic nature. In former times the condition of T., whether it consisted of a deep sleep or an exalted state of consciousness, was attributed to the passage of the soul out of the body of the subject, and the invasion of another spirit for the time being. The theory of spirit possession has not yet gone by the board; carnest, and, in

some cases; scientifically-minded in vestigators are constantly studying such phenomena. From the medical point of view, the T. is held to be a condition of hypnosis, in which the subject may be susceptible to impression of a half-interest of the condition of the first of the fir sions of a hallucinatory nature, and may be entirely impervious to ordinary physical stimuli. See F. W. H. Myers, Human Personality; F. Podmore, Modern Spiritualism.

Tranent, a small tn. in Haddington-Has an

(1911)4369.

Trani, a seaport of S. Italy, prov. ari. on the Adriatic. Trades in Bari, on the Adriatic. Trades in wine, figs, oil, almonds, and grain. The harbour has lost the importance it held during the Crusades. Pop. 32,000.

Tranquebar, a maritime tn. Madras, India, on the Coromandel coast in the Tanjore dist, at the mouth of the Cauvery, 165 m. S. of Madras. It was purchased by Bri-It has tain from the Danes in 1845. a fort, a mosque, and several pagodas.

Pop. 13,142.

Transbaikalia, or Dauria, a prov. of E. Siberia, to the E. of Lake Baikal, almost equal in size to Austria-Hungary. It consists for the most part of a plateau, about 2000 ft. above sealevel, covered with forests, marshes, and prairies, with the mts. of Khamar Daban, Barguzin, and Yabionovi rising above it. The prov. is watered by the affluents of Lake Baikal, and by tributaries of the Amur and Selenga. The climate is, on the whole, The chief industries are cattle- vine is also largely grown, breeding, hunting, fishir and to a certain extent, There are no manufs. of

but fur is largely exporta prov., Khita; other chief towns; animals Bargazin, Nerchinsk, Selenginsk, and domestic Verkhnendinsk. Area, 229,520 sq. m. Pop. is very sparse, 70 per cent. con-sisting of Russians. It is estimated at about 833,400.

Transcaspian Province, a prov. of Asiatic Russia, bounded on the E. by Khiva and Bokhara, W. by the Caspian Sea, N. by Uralsk, and S. by Persia. It has an area of 213,855 sq. m., and a pop. of 440,800. The sq. m., and a pop. of 440,800. The surface is partly mountainous and partly desert, but there is a fertile region at the base of the Kopet Dagl. where wheat, cotton, and fruit are grown, and sheep and cattle pastured. The principal rivers are the Murghab and the Heri-rud, which are useful for irrigation purposes. minerals include gypsum, s sulphur, and the petroleum is important. The inhabita

which is a depression of the Murghab Valley. The town in the easis has an ancient history, and is referred to in the Zendavesta. Alexander the Great added to its importance, but it was destroyed by the Mongols in the middle ages. The ruins at Bairam mark its site. Cap. of the prov. is mines | Ashkabad. Pop.

Transcaspian Railway, owned line of Asiatic Russia, with a terminus at Krasnovodsk, a tn. on the S.E. shore of the Caspian Sea. skirts the southern boundary of the Kara-kum Desert, passing through Mery, Bokhara, Samarcand, Khokand, nects with to Andijan, where a branch line con-

with the

way runnii : 🐪

and Andijan. The gauge is 5 ft., and the total mileage is 2380 m.

Transcaucasia, the southern div. of the gov. of Caucasia, comprising the military districts of the Black Sea and the govs. of Baku, Elisavetpol, Erivan, Kutais, and Tiflis. together with the provinces of Batuna, Kars, and Daghestan. It has an area of 95.402 sq. m., and embraces the most populous and most fertile parts of Caucasia, the valleys of the Rion and the Kura. The chief crops are maize, rice, tobacco, and cotton, but various kinds of fodder are also cultivated, viz., hay, rye-grass and lucerne. The

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are domestic industries are extensively carried on and exhibit a high degree of technical skill and artistic taste. chief town is Tillis. The 6,695,500, belonging to various races.

Transcendentalism, has a double significance: (a) philosophical, and (b) theolo

associated a use of the previous

and his su... idea of a priori (or intuitive) as opposed to a posteriori (or experiential) cognition. In a broader sense T. signifies the attitude of

allied to tl The chief expresses the idea of a supersensuous - -- sciousness, an intultive

f divine truth, as opposed rationalism. The most

began in New England (the Transcendental Club, 1836), and included Emerson, Ridley, Bronson, Alcott, Thoreau, Margaret Fuller, and others.

Transept, in architecture, that part of a building which lies across, or in a direction at right angles to the

main axis.

Transfiguration, Feast of the (Aug. commemorates the important event in our Lord's life narrated in Matt. xvii.. etc. In the English Matt. xvii., etc. In the English Church it is a black-letter day, but it is a red-letter day in the American Church.

Transformer, see ELECTRIC DISTRI-

BUTION. Transformism, or Transformismo. the name given to the parliamentary policy inaugurated in 1884 by Signor Agostino Depretis, when prime minister of Italy, which effectually and completely broke up the old party organisations. Under this system, which purported to unite moderate men from all parties against agitation of the extreme Left, ministers were selected from those heads of factions and interests which commanded most votes in the chamber. It was un-doubtedly intended by Depretis as a bona fide unifying constitutional de-yice, but was not popular with the Italians and was hotly vilified by the extremists.

Transfusion, the passage of fluid from one vessel to another, especially the introduction of fluid into the blood-vessels. Saline solutions are usually used for this purpose, but T. of blood alone provides the necessary ingredients when much blood has been lost. Communication is m in the direct method, from Communication is made, person to the other without blood being exposed to the action of

the air.

Transit Instrument, an astronomical instrument used for ascertaining the right ascension of a star, i.e. the exact moment of its crossing the meridian of a place. It is constructed in various forms including the portable. A telescope is accurately mounted on a horizontal axis which turns on pinions in Y bearings carried on two pillars: this axis is placed due E. and W., and the telescope is thus capable of moving in a vertical plane, which is that of the meridian. A small graduated circle fixed to the axis enables the observer to adjust the telescope to the approximate declination. In the focal plane of the telescope a vertical 'wire,' of spider's web, is placed accurately central, to give the meridian, and other parallel wires are arranged equidistantly. Two horizontal wires are arranged, one on each side of the middle of the vertical

prominent school of theological T. wires, and fairly close. As soon as the star enters the field of view, the telescope is adjusted so that the image travels between these wires. At the moment the image is bisected by the middle vertical wire, the observer presses a button which registers the exact moment on an electric chronograph. Delicate spirit levels are carried for testing the level of the horizontal axis, and a reversing gear is provided whereby the instrument is lifted and reversed, so that the pinions change places and the oppo-site part of the meridian may be observed. The reticle in the focal plane is illuminated by means of a lamp carried on a bracket, and usually transmitting its beams

through the horizontal axis.

Broken transit: In this instrument the eyepiece is fixed at right angles to the telescopic axis, and a prism carried in the central tube reflects the image of the star, which can thus be more conveniently seen. Correction must be applied for 'flexure of axis. Prism vertical transit: The horizontal axis is here placed due N. and S., so that the telescope moves in a vertical circle passing through due E. and W. The transit or meridian circle is a more massive instrument, arranged for reading the declination of the star accurately as it crosses the meridian. The graduated circle is in this case much larger, 2 ft. to 4 ft. in diam., and is sometimes duplicated: the graduations descend to 5 min.. sometimes to 2 min. The movement of the telescope is read by the position of the marks on the circle opposite a fixed index. Reading is carried out by means of a micrometer microscope. in the focal plane of which are crossthe intersection wires, of which appears at the exact reading on the circle. The wires are capable of travel by means of a micrometer screw, the head of which is graduated. The movement of this screw necessary to bring the intersection of the wires to the nearest mark on the circle gives the fraction of the division; this can usually be read to with-In an error of 2 sec., or 1/648000 of the circle. In another form of the instrument the eye-piece of the telescope is arranged to travel by means of a micrometer screw until the wires reach the star, at which position it is kept fixed. At the exact moment contact is arranged to give the time automatically on the chronograph, with a view to eliminating the personal equation. Such an instrument was crected at the Cape in 1903. The methods of transit observation were first used by Tycho Brahé, but the instrument was invented by Olaus Roemer in 1689. The first Greenwich instrument was mounted | R. in 1850.

Transition, in architecture, the passage from one style to another. This process is always slow, and This process is always slow, and hence there is always a period in which the new features are being tentatively introduced.

Transkei Territory, one of the most productive regions of S. Africa, principally in the prov. of Cape of Good

Hope. Translation from one language to another is the art of adequately rendering the writings of one language into the language of another. The whole virtue of a T., as such, lies in its adequacy, and here a slight distinction must be made between two kinds of Ts. The lower kind attempts to convey the literal meaning of its original, and hence adheres slavishly to the text even at the cost of forced and involved constructions. Ts. from a language at a high degree of culture into a language destitute or almost destitute of literature are apt to be of this kind. Slavish verbal accuracy is the great fault of the earliest Ts. made into a Teutonic tongue—the T. of the Scriptures into Gothic by Ulfilas. The aim and method of the higher T. is oxpressed by Dryden in language oxpressed by Dryden in language this kind. Slavish verbal accuracy is which has never been bettered. Speaking of poetical T. he says, 'Thus it appears necessary, that a man should be a nice critic in his mother-tongue before he attempts to translate a foreign language. Neither is it sufficient that he be able to judge of words and style; but he must be a master of them too: he must perfectly understand his author's tongue, and absolutely command his own. So that, to be a thorough translator ho must be a thorough poet. Neither is it enough to give his author's sense in good English, in poetical expressions, and in musical numbers; for, though all these are exceedingly difficult to perform, there yet remains a harder task; and it is a secret of which few · translators have sufficiently thought great example, Fitzgerald's T. of the Quatrains of Omar Khayyam, the Persian astronomer and poet. Here

Transleithania, the name given to

the T. is not the minister, but the equal and even the superior of its

original.

1 : ... رستين د سين

sing flun-

The Austrian half is called Cisleithania. Budapest is the capital. Transmigration, or Metempsychosis, the T. of the soul, as an immortal essence, into successive bodily forms, cither human or animal. This doctrine appears to have originated in Egypt. The Egyptians are, morcover, the first who propounded the theory that human soul is immortal, and when the body perishes it enters into some other creature who may be born ready to receive it, and that when it has gone all the rounds of all the created forms on land, in water, and air, then it once more enters the human body born for it; and this cycle of existence for the soul takes place in 3000 years. Plato extends the cycle of existence to 10,000 years, which is divided into periods of 1000 Plato extends years, after the lapse of which the souls undergo judgment, and are consouls undergo judgment, and are constant demned to punishment or admitted to everlasting happiness. Pythagoras, who is supposed to have travelled in Egypt, brought this fantastic doctrine into Magna Græcia, and made it a prominent part of his teaching. No doubt the Egyptian custom of preserving the mummies of cats, crocodiles, and some other creatures, had its origin in the belief that they had

Transmission of Power, sec PNEU-MATIC DISPATCH, GEARING, PULLEYS, TRAMS, ELECTRIC DISTRIBUTION, etc. Transpadano Republic, see CISAL-

been inhabited by souls which might some day claim these bodies for their

PINE REPUBLIC. Transplanting. Removing seedlings and other plants and trees from one situation to another is found to im-prove the progress of many plants and specially those of the cabbage tribe, the point of the tap root being broken and a mass of fibrous roots caused to form. In T. shrubs and trees the fibrous roots should be disand preturbec air drying cautic be at the should be them. translators have suniciently thought, them.

—that is, the maintaining the charder of an author, which distinguishes him from all others, and makes him appear that individual noet whom you would interpret.'

There is a last kind of T., which can best be explained by naming its machines are used for moving large report exercited to the trees. trees.

Transport, the process of carrying supplies for a military expedition. The armies of the middle ages invariably lived on the country in which they were campaigning, with the result that the inhabitants were exampled to the country in the result of the country in the country i quickly rendered destitute of food sing Hun-and the army itself became ineffec-Croatia-of Leitha the country. In modern armies a

specialised branch of the military organisation is devoted to questions of T. and supply, and the British army, through the necessity for colonial and punitive expeditions, possesses a particularly well-developed T. service. Road T. is worked by the Army Service Corps. The supply of field units is divided into two lines, first and second. The first-line wagons carry ammunition, tools, and ambulance supplies, and is in immediate contact with the fighting line; the second line carries camp supplies with a reserve of ammunition, tools, medical supplies, etc. The chief officer of T. is known as the Director of T. and Remounts, and is directly commanded by the quarter-master-general.

Transportation. According to Stephen the earliest instances of T. as a punishment in England probably occurred in the reign of Charles II., when pardous were granted to persons under sentence of death, conditionally on their being transported for a number of years—usually seven. T. was unknown to the common law (q.v.), a fact which seems to be capable of explanation on the ground that England had no colonial empire of any pretensions before the Stuart period. There was, however, at common law, an analogous punishment with which the contractions are common to the contraction of the contrac ment, viz. exile, which followed on conviction when a criminal took sanctuary and confessed; the criminal in such case was permitted to leave the kingdom under an oath of abjuration binding him never to return. T. was first legalised by an Act of 1719. During the 18th and early part of the 19th centuries, numerous Acts were passed by which various terms of T. with alternative terms of imprisonment, and, in some cases, whipping either as an alternative or cumulative punishment, were allotted to specific offences. These statutes appear to present no sort of consistent principle, for in certain classes of cases the sentence was T. for life; in two the punishment was absolute without alternative; while in another, power was given to transport for any other term without fixing any minimum term of T. or any alternative term of imprisonment. T. was gradually abolished between 1853 and 1864, principally because the colonies objected to receive the convicts; penal

Edu as the Penal Servicude Acts authorise the carrying out of the Isentence in any part of the dominions, the difference between T. and these two punishments seems verbal only; and again, the provisions of the Act of 1719 are still in force as regards:

specialised branch of the military prisoners under sentence of penal organisation is devoted to questions servitude. See LABOUR COLONIES. of T. and supply, and the British Transporter Bridge, see BRIDGE.

Transposing, in music, signifies the changing of a piece of music to another key. In the case of a vocalist T. is an easy matter, but in the case of instrumental music it requires much musical skill.

Transubstantiation (Lat. transubstantiatio, change of substance) indicates the change which is believed by Roman Catholics to take place in the Eucharist elements of bread and wine, in virtue of the consecration. According to the Roman Catholic doctrine, 'the whole substance of the bread is changed into the body of Christ, and the whole substance of the wine into His blood, the species alone remaining.' The precise meaning of 'species,' or, as it is sometimes put, 'accidents,' in this definition is not shown, but popularly it may be said to mean the appearances, '.e. those qualities or conditions which produce upon the senses the Impression of the presence of bread and wine. T. does not imply that the body and blood of Christ are formed out of the substance of the bread and wine, but that in virtue of the Eucharist consecration, the substance of bread and wine cease to exist, and the body and blood of Christ take their place.

Transvaal, an original prov. of the Union of S. Africa, lies immediately N. of the Orange Free State and S. of Southern Rhodesia, bounded E. by Portuguese E. Africa and Swaziland, and W. by the prov. of Cape of Good Hope and the Bechuanland Protectorate. The Limpopo or Crocodile R. flows along its N. frontier, and the Vaal R. marks its S. border. The area of the province, which is divided into twenty - three districts, is 110,426 sq. m., with a population of 1,676,611, of whom 420,831 are whites or Europeans, 1,224,155 are natives, the balance of 31,625 being made up of other coloured races. In 1903 about 7000 sq. m., including the districts of Wakkerstroom, Utrecht, and heid, were annexed to Natal. surface has an average elevation of 4000 ft. A plateau, called the High Veld or Hooge Veld, extends across the province, broken here and there by low mountains and detached heights. The chief mountains are the Witwatersrand, lying between Pre-toria and Johannesburg on the E. and Maleking on the W.; the Lydenburg and Barberton Mts. in the district of Barberton; the Zand River Mts. in the district of Waterberg; and the Murchison and Zoutpansberg ranges in the irections-Vaal, and E. .

streams flowing S. from the Witwatersrand. The rivers in the S.E. of the province flow towards Delagoa Bay. The largest lake is Lake Chrissie, N.E. of Ermelo. The country has a healthy climate except in the low-lying tracts in the N. and E. The rainy season is in the summer, when severe storms occur; the winter is dry. The chief industry is gold-mining, extensive mines being in operation near Johannesburg, Witwatersrand, and Barberton. The output of gold exceeds £30,000,000 annually, and diamonds are exported to the value of £1,238,000 yearly. Other exports include horses, mules, tobacco, coal, wool, clothing, haberbacco, coal, wool, clothing, haber-dashery, jewellery, skins, hides, horns, machinery, hardware, and vehicles. The total exports amount to about 234,000,000 annually, and the imports to £20,000,000. There are manufactures of coaches, wagons, machinery, flour, bricks, tobacco, tiles, pottery, malt liquors, and brass and iron product. The yeld supports layer products. The veld supports large numbers of cattle, horses, sheep, and pigs. The annual expenditure of the province (£6,000,000) slightly exceeds the revenue, and the public debt is about £40,000,000. There are 707 (including 12 coloured) schools, with about 54,500 pupils. The English language is being taught in the Dutch language is being taught in the Duton schools, and, later on, it will be predominant in the higher grades. The Dutch churches take first place, being followed by the Anglican, Presbyterian, Methodist, Roman Catholic, Lutheran, etc. The Transvaal Police consists of about 1550 officers, noncommissioned officers, and men. The gold, silver, copper, iron, quicksilver, capital is Pretoria (pop. 48,609), but lead, and salt. Stock raising, agriculthe largest town is Johannesburg, ture, and fruit growing are important with a pop. of 237,220, one-half and one-half coloured. 2400 m. of government railway ... yields large crops of 26 m. of private railway in the pro-maize, wheat, rye, flax, homp, Th vince. known terr the Boers, Colony in mand οf drove the Zulu warriors of Moselekatse, the revolted general of Chaka, katse, the rovolted general of Chaka, across the Limpopo. After the over-throw of Dingaan by Pretorius, the independence of the republic was acknowledged by Britain at the Zand the River Convention of 1852, and Marthinus Wessels was elected president three years later. The Boers were turn three years later. The Boers were turn many thousands of Germans constantly at war with the natives, especially on the N. and E. borders, turn became a principality when John

to the sea. The High Veld forms the and in 1876 a commando was sont to watershed between the basin of the attack Schukuni, a native chief living Limpopo and the basin of the Vaal, their numerous tributaries, including the Olifants R., the Ingalele, the Zand R., the Marico, and numerous other for help. In consequence of their financial difficulties and troubles with the natives, the country was annexed to Britain in 1877 by Sir Theophilus Shepstone. Three years later the Boers took up arms for the restoration of their independence, and after the fall of Colley at Majuba Hill, they gained their object in 1881, subject to the suzerainty of Queen Victoria, The discovery of gold in 1886 brought a great influx of 'Uitlanders,' who were looked upon with disfavour by President Kruger. These Uitlanders were treated with great harshness. and difficulties arose, leading to the Jameson Raid and the gauntlet being thrown down to Britain in 1899, cul-minating in the Boer War, which re-sulted in the loss of the Boer inde-pendence in 1902. In 1910 it was merged in the Union of S. Africa. Transverse and Transversal, in

geometry, the straight line drawn intersecting two parallel straight lines. The angles formed are thus related: ; (2) the oxt interior and ne sido : ir angles on the same side is equal to two right

angles. sinc gar . por its

vanian Alps divide the country from Roumain. The area was 23,700 sq. m. The surface is all of the local by the in parts, and is without the innumerous affluent of the Protection. the Theiss. The minerals embrace tile plain in the centre

· yields large crops of notatoes, a Kronstadt, the most

2,459,000, Magyars, Greeks, Armonians, and Slave. T. corresponds with the Roman Dacia, which was overrun by the Huns under Attila in the 5th century. Zapolya, the weiwede of T., threw off | his allegiance to the emperor and acknowledged the suzerainty of the sultan. In the early part of the 19th century efforts were made to bring about a union with Hungary, which onded in T. being made a crown land of Austria in 1849. It was finally merged into the Austro-Hungarian empire in 1868.

Trap, a term applied vaguely, in geology, to any dark-coloured fine or medium grained basic igneous rocks, such as dolerite and diabase. Mica-trap is the name applied to mica-lamprophyre. These trap rocks

occur as dyke rocks and lava flows.

Trapa, or Water Caltrops, a genus
of aquatio floating plants (order
Onograriacete) bearing white flowers,
followed by hard fruit, the kernel of which consists largely of starch. The large black spiny fruits of T. natans, water chestnut, or Jesuit's nut, are used as food in Southern Europe. The sweet white kernels, Singhara or horned nuts (T. bispinosa), are largely eaten and used medicinally in India. These and other species are sometimes grown in tanks in Britain. Trapani, a scaport on the N.W.

coast of Sielly, cap. of the prov. of the same name, stands on a small penin-sula 30 m. N. of Mazzara. It is an episcopal see, and expects wine, olive oil, salt, cheese, etc. There is trade in corul and mother-of-pearl goods. It was originally a Carthaginian

fortress.

rtress. Pop. 70,000. Trapezium, the multiple star Orionis. There are ten stars, of which four, magnitudes 4.7 to 8.0, form the corners of a trapezium. They form the nucleus of the great nebula in Orion, and show the 'early' type of helium spectrum.

Trapezoid, Trapczium and Euclidian geometry, are plane quadri-lateral rectilineal figures; the former has no parallelism between opposite sides, the latter has one pair of

opposite sides parallel.

Trapezus, sce TREBIZOND Trapp, Joseph (1679-1747), a writer, born in Gloucestershire, and graduated at Wadham College, Oxford. He began his literary career early in life afterwards identified himself with the Tory party, acting for Dr. Sacheverell at his trial. He was also chaplain to Sir Constantine Phipps and to Lord Bolingbroke. Among his works are: Prælectiones Poeticæ, 1711, and Peace, 1713.

Trapping, the art of so constructing more or less mechanical snares so as to capture or kill some animal. The art is probably one of the oldest in existence, since even the earliest and most uncultured peoples of whom colr, coconnuts, areca nuts, becawax, we have any record used traps, ginger, cardamoms, coffee, popper,

although they were usually devoid of any mechanical contrivance, and merely consisted in the digging of a cavity into which the unsuspecting victin fell. In many cases traps are used simply for the purpose of cap-turing the victim without injury. Bird traps, on the cage principle, and door traps may be regarded in this category. Other traps are so con-structed that they seize the victim, but at the same time, except under special circumstances, do it no injury; whilst a third variety consists of a mechanical contrivance not only for capturing but for killing the victim

as well.

Trappists, a religious order which owes what was practically its foundation to Dominique Armand Jean le Bouthillier de Rancy (1626 - 1700). Until the age of thirty-four De Rancy led the voluptuous life of a courtierpriest. Then in 1660 a sudden change came over him and he retired to live a life of austerity and devotion in tho Cistercian abbey of La Trappe, which had long formed part of his posses-sions. The abbey, which had been founded about the middle of the 12th century, was lax in discipline, and it was with the greatest difficulty that De Rancy introduced a stricter ob-servance. The new community devoted themselves to the observance of strict silence and seclusion from the world, to hard labour, to total abstinence from wine, eggs, fish, and all seasoning of their simple diet of bread and vegetables.

Trasimene Lake, also known as Lake Perugia, in Umbria, Italy, 12 m. W. of the tn. of Perugia. In 1898 it was partially drained into the Tiber, some 5500 acres of land being reclaimed. Famous for Hannibal's great victory over the Romans under Flaminius, gained on its shores in

217 в.с.

Traun, Lake, is situated in Upper Austria. It is about 7 m. long, and is 1385 ft. above sea-level, having on its E. side the Traunstein (5450 ft.).

Trautenau a tn. of Bohemia, Austria, on the Aupa, 74 m. N.E. of Prague. It is chiefly engaged in the linen industry. Pop. 16,096. Travancore, a feudatory state of

the Madras Presidency, India, stretching along the Malabar coast from Cape Comorin to Cochin, its shores being washed by the Indian Ocean. It is 140 m. long, with a maximum breadth of 70 m. Area 7129 sq. m. Pop. 3,428,975. The coast is low, but the footbills of the Western Ghats diversify the scenery and slope to diversify the scenery and slope towards the ocean. Its capital is Trivan-The principal products are drum.

and timber. See Mateer's Native Life in Travancorc, 1883.

Travellers, see COMMERCIAL TRA-VELLERS.

Traveller's Joy, see CLEMATIS.

Traveller's Tree, or Ravenala madagascariensis, a tree with long and large fan-shaped leaves, the petioles or leaf stalks of which form a large cavity at their base. In this water collects and is drunk by animals and travellers.

Traverse City, in Michigan, U.S.A., on the Boardman R., the co. scat of Grand Traverse co. Has a good climate and picturesque scenery, and is resorted to by tourists in the summer months. Manufs. agriculsummer months. summer months. Manufs. agricul-tural implements, sleighs, furniture, leather, flour, etc. Pop. (1910) 12.115. Traverser Bridge, see Bridge.

Travertine, or Calc-sinter, is porous calcareous material deposited from mineral springs (q.v.). It may be chalk-like in texture, but is often hard enough for building stone, many of the buildings in Rome (St. Peter's) being built with it. At San Filippo the T. is deposited at the rate of 3 ft.

a year.
Travnik, a prov. and tn. of Bosnia-Herzegovina, Austria, on the Lasva, 45 m. N.W. of Sarajevo. It has an

old castle and a horse-breeding es-tablishment. Pop. 6660. Trawling, see FISHERIES, SEA. Treacle, the dark-brown mother liquor remaining when sugar is crystallised from the expressed juice of the sugar-cane. The T. or molasses contains about 50 per cent. of sugar, which does not crystallise owing to impurities. In the W. Indies, T. is used for the distillation of rum, but processes are also in vogue for extracting nearly the whole of the sugar.

Treacle Bible, the 1568 edition of the Bishops' Bible, is so called from its rendering of Jer. viii. 22, 'Is there no treacle in Gilcad?' where the A.V. has 'balm.

Treacle Mustard, or Erysimum cruciferous ormerly given cant lan-

guage known as 'the everlasting staircase,' worked by persons treading on steps fixed on the periphery of a horizontal wheel. It is used chiefly as a means of prison discipline, or to give useful employment in the shape of grinding corn or moving machinery to persons imprisoned for crime, and comes under the category of 'hard labour.' The prisoners hold on to a hand rail and work in separate compartments, and the speed is regulated by a warder by means of a lever. It is now almost obsolete as a form of nunishment.

Treason means treachery against the sovereign. By the Statute of Treasons, 1352, it is T.: (1) To compass the death of the king, queen, or their eldest son. 'Compass' imports design, which must be manifested by an overt act (e.g. providing weapons), for idle words do not now constitute T. though they may amount to a misdemeanour. The conviction of Peachum and Sydney shows that the commission, even without publica-tion, of 'treasonable' ideas to writing is T., but it is extremely doubtful whether a modern judge would direct a conviction for T. at the present day. (2) To violate the king's companion, eldest unmarried manier eldest son's wife. (3) To lovy war eldest son's wife. This realm. This includes levying war to reform religion, remove councillors, or redress grievances, inasmuch as private persons may not forcibly interfere in grave matters; e.g. in Anne's roign Damarce and Purchase were convicted of T. for burning certain dissenting meeting-houses, the court inferring a general design against the (4) Adhering to the king's state. enemies in his realm by giving themaid in his realm or elsewhere. The overshadowing power of present-day central governments makes it grotesque for any individual to hope to ap-proach a project of rebellion in England with the prospect of even partial success. When the case of R. r. Lynch (1903) came before the courts there had not previously been a charge of high T. tried for sixty-two years. It was moved to quash the indictment (q.v.) in this trial on the ground that each count charged an adhering 'without the realm' (viz. in the Transvaal), and so disclosed no statutory offence. The court held that the statutory words did not mean merely that the accused being in the realm has been adherent to the king's enemies wherever they were, for that so narrow a construction not only would enable an Englishman to engage with a hostile power against his own country so long as he took care to remain abroad, but also makes the words 'or elsewhere' meaningless. The case also decided that the Naturalisation Act does not enable a British subject to become naturalised in an enemy state in time of war, and that to do so is in itself an overt act of T. (5) Counterfeiting the king's seal or money or importing money (not now T.). (6) Slaying the chuncellor, treasurer, or king's justices. The punishment for T. was formerly hanging, drawing, quartering after the traiter had been dragged to the place of execution on a hurdle; it is now hanging only. T.

jure king who is not also de facto

Treasure Trove. Money, plate, or similar articles discovered hidden in the earth or some other secret place for so long a time that the owner is unknown. In default of finding the owner, the established principle of English law is that the crown is entitled to the treasure (see CROWN). By civil law (q.v.) the finder of goods hidden in his own soil was entitled both as owner and finder; but if the things were found by one person in the ground of another, one half went to the owner of the ground and the other half to the finder; if found on public land, half went to the fise and half to the finder.

Treasury, a government depart-ment which controls the management collection, and expenditure of the public revenue (q.v., and see also CONSOIS, PUBLIC DEBT, and TER-MINABLE ANNUTTIES). In the Plan-tagenet period the T. was known as the Scaccarium (Exchequer), and was so named because the committee of the king's continual council (see CABINET and PRIVY COUNCIL) when sitting for revenue purposes sat round a chequered table in a room which was therefore called the Scaccarium. The old Exchequer was divided into the Upper Exchequer or Exchequer of Account, and the Lower Exchequer or Exchequer of Receipt, the former department recording and checking payments made for the service of the state and the sovereign, the latter receiving pay-ment of royal dues payable by local officers appointed for their collection. The head of the Exchequer was the Treasurer, an official who became, during the reign of Elizabeth, the most prominent official in the state. In 1612 the T. was placed in commission, and that is its present constitutional condition, although its real head is the Chancellor of the Exchequer. The titular head is the First Lord of the T., who is almost invariably the Premier.

Treasury Solicitor, the legal adviser to the government departments. He defends actions brought against ministers or certain other public functionaries. He deals with such intestate estates as escheat (q.v.) to the He is generally a qualified barrister. As to his duties in his capacity of King's Proctor, see under

that title.

Treating, see Elections—Corrupt

Treating, see ELECTIONS and illegal practices at elections.

Treaty. The T.-making power is the prerogative of the crown (q.v.), as

cannot be committed against a deling to the minister representing the crown in the country with whom the T. is to be made an instrument under the Great Seal (see SEAL) containing the authorisation to sign a T. itself usually contains a clause pro-viding for its ratification by both sides, and until the ratifications are exchanged neither party is bound by The crown in theory is the sole T.-making power in England, but according to Sir William Anson a T. which lays a pecuniary burden on the people, or which alters the law, requires parliamentary sanction. Further, Ts. which involve the cession of territory, or confer immunities on foreigners, or affect the rights of the private individual are probably only conditional on the approval of parliament as confirmed by an Act. But it seems an open question whether in the case of territory acquired by con-quest or cession the crown has unlimited power to cede such territory

Trebbia, or Trebia, a riv. of ancient Italy, noted for the victory gained on its banks over the Romans by Hannibal in 218 B.C. It rises in Liguria in the Apennines, and flows in a N.E. direction through Emilia. joining the Po above Piacenza.

Length 71 m.

Trebisch, a tn. of Moravia, Austria, on the R. Iglawa. Manufs. cloth. Pop. 11,000.

Trebizond: 1. A vilayet of Turkey in Asia, extending along the shore of the Black Sca. Area 16,671 sq. m. Pop. 1,265,000. 2. The cap. of the above vilayet, is a port on the Black Sea, 108 m. N.W. of Erzerum, for-merly of great importance as an om-porium for the wares of Kurdistan and Persia. The town has strong fortifications and walls, but has lost much of its transit trade since the Batum-Tiflis railway was opened. Batum-Tills railway, but the first strength of the chief exports are hides, skins, eggs, opium, tobacco, and filbert nuts. Its silk industry is declining. T. was founded in 600 B.C. by Greek settlers from Sinope. In 1204 it was the capital of Trebizond, an empire constituted by Alexius Comnenus. It became Turkish in 1462. In 1895 it was the scene of the Armenian atrocities.

Treble, the highest part in three- or four-part vocal music, especially applied to boys' voices; the corresponding pitch in the female voice being known as soprano. Originally, the dominant part of harmonised song was the lowest; a higher part was known as allo, and one still higher was called T.

Trobonius, Gaius (d. 43 B.C.), was the

promoter of the Lex Trebonia, pronegotiations for a T. are begun by send- posing Pompey for the two Spains . Ιη V•

Crassus for Syria, and Casar for the The European T. (Hyla arborea) is Gauls and Illyricum. He was governor bright leaf green above and white in Further Spain in 47 as proprætor, but was expelled from the province by a mutiny of the soldiers. In 45 he was raised to the consulship by Cæsar, but in spite of this was one of the prime movers in the conspiracy to assassinate him. He was slain by Dolahella in 43 n.c.

Tredegar, a tn. of Monmouthshire, England, 17 m. N.W. of Newport.
The chief industry is coal mining.

Pop. (1911) 23,604.

Tredgold, Thomas (1788-1829), born at Brandon, near Durham. He was apprenticed to a carpenter and worked for five years at the trade. He then removed to London and obtained employment in the office of While here he wrote an architect. many scientific works. Of these the following are the principal: Elementa P

iŁ. Railroads and Carriages, 1825; Remarks on Steam Navigation, etc., 1825.
The last important work published by

Tree, a perennial plant with a woody stem and branches differing In palms only in size from a shrub. and other trees the terminal bud of the primary stem is the only one to develop, and thus a long, unbranched trunk is formed. Ts. do not often exceed 100 ft. in height in Britain, but the sequoias of redwoods of but the sequoias or redwoods California are known sometimes to exceed 300 ft .- the greatest authentic height is 325 ft.—and Eucalyptus amygdalina of S. Australia grows to about 280 ft.

Tree, Sir Herbert Beerbohm (b. 1853), an actor manager, born in London. He made his first appear-London. He made his first appearance on the stage in 1877, and tenyears later became manager of the Haymarket Theatre. He is now proprietor and manager of His Majesty's Theatre. He is recognised as the He is recognised as the his profession, and is leader in leader in his profession, and a sepecially famous for his productions of Shakespeare's plays. He has published lectures on The Imaginative Faculty, and on Hamlet from an Actor's Prompt Book, Henry VIII. and his Court, etc. His Thoughts and Machaethe vere Afterthoughts were

Tree-fern, a fern

underneath, and possesses powers of colour change. The male has a tinge of brown on the throat. The digits bear adhesive discs, with which it readily climbs even up grass. The male croaks loudly, especially on the approach of rain. They are very active insect hunters, and are often kept in fern cases and greenhouses.

Tree-nottle, see NETTLE-TREE.
Tree-worship, in some form or other, seems to be universal. In Europe, the veneration of trees as sacred objects or the habitat of deities continued to a late date, and we find records of it in many of the accounts of the early Christian missionaries in the N. The veneration of the sacred oak was a leading feature of the Prussian religion, and all know that the same tree and its parasite mistletoe were venerated by the

ms the too were venerated by the mt Britons. In Lithuania this of worship continued down to 14th century. T. falls into two ions. In the more primitive form the tree is itself considered as an animate being. In the later and more common form it is considered as the residence of a height which can detach T. was The Sleam-Engine, 1827 and residence of a being which can detach 1838. sometimes bound up with those of the tree. See Frazer's Golden Bough (2nd 1900, and article by S. A.

ed.), 1900, and a Cooke in Ency. Bril.

Trefoil, the name given to various three-leaved plants. Moro than twenty British species belong to the genus Trifolium. Bird's foot Ts. are included in the genus Lotus.

Trefouret, Jeanne Alfredine, sce HADING, JANE.

Tregelles, Samuel Prideaux (1813-75), an English New Testament scholar, born at Falmouth. His chief work was a Greek New Testament (1857-79). He also published other works on the same lines, and edited Hebrow and Greek dictionaries.

Tréguier, a tn. in the dept. of Côtes-du-Nord, Franco, at the junction of the Guindy and Jaudy rivers. Pop.

3300. Treinta y Tres, the cap. of the dept. of the same name, Uruguay, 150 m. N.E. of Montevideo. Pop. 4000.

N.E. of Montovideo. Pop. 4000.
Treitschke, Heinrich Gotthard von
(1884-96), a German historian and
publicist, author of the History of
Germany in the 19th Century. As a
roung man he allied himself with the
of progress, but as he grew
his political views became reactionary. For many years he sat in

rhizome, somewhat his political views became rein structure. Many Ts. belong to the actionary. For many years he sat in m structure. Many 18. belong to the actionary. For many years he say in genus Cyathea.

Tree-freg, a name given to members of the family Hylidæ. They are widely distributed, especially in uncompromising character. His col-America, but absent from Britain. translated one of his pamphlets.

Trelawney, Sir Jonathan (1650-1721), an English divine, held successively the bishoprics of Bristol, Exeter, and Winchester. In 1688 he was numbered among the seven bishops tried under James II. for refusing to conform to the Declaration of In-He is

dulgence, but was acquitted. He is the hero of R. S. Hawker's ballad, And shall Trelawney Die? Trelawny,Edward John (1792-1881), an English traveller and man of letters; met Shelley and Byron in Italy in 1822, and was present when the former was drowned. In 1858 he published his Records of Shelley, Byron, and the Author. He took part in the Greek struggle for independence in 1823. He survived until his

ninctieth year.

Tremadoc Slates are dark earthy slates, and form the top beds of the Upper Cambrian system.

Trematodes, a class of flat worms, with an oval non-segmented body.
Many of them are parasitic, and among the most important are Distomum hepaticum and D. lanceolatum, which cause liver fluke (q.v.) in sheep and other ungulates. Among T. arc other important parasitic T. are Amphislomum Collinsi and Gastro-discus Emptiacus, both of which infest the intestines of horses, Bilharzia crassa, a blood parasite of cattle and occasionally of man in the tropics.

Tremiti, a group of islands in the Adriatic Sea, belonging to the province of Foggia, Italy. San Nicola, San Domino, and Caprara are the

chief ones.

Tremeille, Charlotte de la (1599-1664), Countess of Derby, a daughter of the Duc de Thouars, and was married in 1626 to the Earl of Derby. In 1644 she held Lathom House in Lancashire for three months against a besieging force of Roundheads. See Colonel Hutchinson's Memoirs.

Tremolite, sec AMPHIBOLE.

Trench, a military work which can be used either for defensive or offensive works. In the case of sieger, Ts. may be thrown up either to defend the fortress or town, or to give cover to the attacking force by means of which they can approach nearer to

the town or fortress.

Trench, Friedrich von der, Baron (1726-94), a Prussian officer; when only sixteen years of age he became a cadet in the bodyguard of Frederick the Great. He was soon promoted, and distinguished himself in a campaign against Austria; but his insilk, pottery, and of the salami trigue with Princess Amela of Prussia led to his imprisonment in the citadel near. Pop. 30,001. of Glatz in 1745. He, however, effec-

Leipzig in 1907. Mr. Hyndman has ted his escape and entered the Russian service. In 1745 he was again arrested and imprisoned in the fortress of Magdeburg, and was only set at liberty in 1763. He afterwards published Sämmiliche Gedichte und Schriften and Merkwirdige Lebensheschreibung. T. was ultimately guillotined.

Trench, Richard Chenevix (1807-86), an Anglican archbishop and poet, born at Dublin. He was professor of divinity at King's College, London (1847-58). dean of Westminster (1856), where he instituted evening nave services, and archbishop of Dublin (1863). His poems show him to have been a gifted disciple of Wordsworth; and The Study of Words established his reputation as a philologist. He also published Notes on the Parables of our Lord and Notes on the Miracles of our Lord; and it was he who gave the first impulse to the great Oxford New English Dictionary.

onary. Trendelenburg, Friedrich 202-72) a German philosopher Lübeck, and Month (1802-72), a German philosopher, born at Eutin, near Lübeck, and educated at Kiel, Leipzig, and Berlin universities, being professor at the last-named from 1833 till his death. Chief work, Naturrecht; also published Elementa logices Aristotelica, Logische Untersuchungen, etc. Lives by Bonitz (1872) and Kleinert

(1872).

Trongganu, a state of the Malay Peninsula, having on the N. the China Sea and on the W. Kelantar. It was ceded by Siam to Britain in 1909. Its chief industry is fishing, and it has also tin mines. The capital is Trengganu, with a pop. of about 15,000. Area of state, 6000 sq. m. Pop. 146,920.

Trent, the third most important riv. of England, rising in Stafford-shire and device the control of Derby. and Ouse Lincoln, to form the Humber. It is about 170 m. long, and is connected with other rivers by canals. The chief towns on its banks are Nottingham.

Newark, and Burton-on-Trent. The

chief tributaries are the Idle, Tame, Dove, Derwent, and Sow.

Trent, a tn. of the Tyrol, Austria; stands in a beautiful situation on the Adige, 25 m. N.W. of Venice. the ancient Tridentum, has embattled walls, and a large ruined castle. It is the seat of a bishop and has a splendid marble cathedral. In its former church of Sta. Maria Maggiore the famous Council of T. sat (1545-63). T. is noted for its manufactures of

Trent Affair, occurred during the

Charles Wilkes intercepted the British steamer Trent on its way from Havana to St. Thomas and carried off two Confederate commissioners, Messrs. Mason and Slidell. They were taken to Boston and imprisoned in Fort Warren, but released in 1862 on the demand of the British government,

Trente-et-Quarante, sec GAMBLING. Trenton: 1. The cap. of New Jersey, U.S.A., on the Delaware R., 33 m. N.E. of Philadelphia. It is an important industrial centre, especially for pottery, but iron, steel and copper wire, rope, cables, rods, plumbers' supplies, and all kinds of machinery are also manufactured. Pop. (1910) 96,815. 2. A city and co. seat of Grundy co., Missouri, U S.A., on the Grand R. It is a trading centre for a prosperous farming region. Pop. (1910) 5656. 3. A tn. and port of entry in Hastings co., Canada, on Trent R. It has an extensive export

of timber, and large manufacturing industries. Pop. about 5000.

Trenton Falls, a summer resort in Oneida co., New York, U.S.A., noted for its scenery, named from the falls, which consist of six cataracts with a total descent in 2 m. of 312 ft.

Trepang, sec BECHE DE MER. Trephine, or Trepan, an instrument with a circular saw edge, adapted for cutting and removing a piece of bone from the skull. The operation of trephining is called for when a porof the brain is compressed through fracture or other injury; or when a tumour or abscess needs to be

removed.

Trepost, Dmitri Feodorovitch (1855-1906), a Russian general, entered the army in 1872. He took part in the campaign against Turkey in 1877, and was wounded, and in 1895 was raised to the rank of colonel. having had a quarrel with the Grand Duke Nicolas, then at the head of the cavalry, he had to leave the army. He was afterwards placed at the head of the police force in Moscow (1896) by the Grand Duke Sergius, then governor-general of that town, and raised to the rank of major-general in 1900. He resigned, however, in 1904, and in the following year was appointed governor-general of St. Petersburg, when he did much to put down the disturbances then rife in the capital.

Treport, Le, a scaport in the dept. of Scine-Inférieure, France, 16 m. E.N.E. of Dieppe. The chief export

is sugar. Pop. 5000.
Trespass, in a wide sense, denotes Trespass, in a wide sense, denotes any transgression (not amounting to a felony) whether it relates to person or property. Hence striking another, and detaining another's goods, confertile valley shut in by vine-elad

American Civil War in 1861. Captain stitute T., as also default in the performance of a contract, and any misfeasance which results in loss or damage to another. damage to another. In a narrower and more popular sense it denotes an unauthorised entry on another man's land, though in law no T. is committed unless there is some damage however inconsiderable or even technical e.g., 'bruising the grass' was the customary allegation in a writ of T. for breaking a close '). But technically the highly-complicated notion of T. connotes essentially 'adverse contact' whether to person or property. This kind of T. in the language of old pleadings (q,v) was called T. vi d armis (by force and arms) (see also T. vi d armis (by force and arms) (see the property of the proper notion of T. had stopped here, meaning would have been certain; but the common law extended it so as to embrace acts not involving contact, and not per se immediately injurious, but only injurious by conscquence and collaterally. This was called special trespass, or trespass on

the case.

Tres Tabernæ ('Three Taverns'), a vil. and post station of Latium on the Via Appia. Here St. Paul's friends came to meet him on his journey to

Rome.

Treuen, a tn. of Saxony, 5 m. W.N.W. of Auerbach. cotton and woollen goods. Pop. 8222.

Trevelyan, Sir Charles Ed ward. K.C.B. (1807-86), an Anglo-Indian official and organiser; went to India in the service of the East India Company in 1827, and was concerned in Indian finance and government till his retirement in 1865. He published several works on educational, politi-

cal, and religious subjects.

Trevelyan, Sir George Otto, second Baronet (b. 1838), the only son of Sir Charles Edward T. and Hannah Moore, the sister of the great Lord Moore, the sister of the great Lord Macaulay; born at Rothley Temple, in Leicestershire. He was educated at Harrow and Trinity College, Cam-bridge. In 1865 he entered Parlia-ment as Liberal representative of Tynemouth. In 1868 he was returned for Hawick Burghs, and in 1887 for Glassow. In

Glasgow, In Lord of the otary of the of Secretary

for Ireland, in 1884 Chancellor of the Duchy of Lancaster and member of the cabinet, in 1886 and again in 1892 Secretary for Scotland. In 1897 he retired from public life. He has published a number of works dealing

hills. It was formerly the cap. of an archbishopric and electorate of the empire, and is now the seat of a Roman Catholic bishop. It contains more important Roman remains than any other place in Northern Europe, notably the picturesque ruins of the Titian. It is a bishop's see. Pop. notably the picturesque ruins of the Imperial Palace; the Porta Nigra, or Roman rate, part of the ancient defences of the town; the basilica or Palace of Constantine, now an evangelical church; baths, and an amphitheatre. T. has trade in wines, and manufs. machinery. Other industries are tanning, dyeing, and iron-founding. T. claims to be the iron-founding. T. claims to be the oldest town in the German empire. It was important as early as the 1st century, and during the 3rd and 4th centuries was frequently the residence of the Roman emperors.

Treves.

Treves, Sir Frederick, Bart. (b. 1853), an English surgeon and author, born in Dorchester. He was Hunterian professor of anatomy and Wilson professor of pathology at the Royal College of Surgeons (1881-86), and consulting surgeon to the forces in S. Africa (1900). He performed the operation on the late King Edward for appendicitis in 1902, but has now retired. His works include: Physical Education: System of Surgery; Manual of Operative Surgery; Surgi-Manual of Operative Saligery, Salyrocal Applied Anatomy; German-English Dictionary of Medical Terms; Tale of a Field Hospital, 1900; The Other Side of the Lantern, 1905; Highwaysund Byways in Dorsel, 1906; Salyrocal Sol Cradle of the Deep, 1908; Uganda for a Holiday, 1910; Through the Deso-late Land, 1912; The Country of the Ring and the Book, 1913.

Trevigi, or Treviso, Girolamo da (1508-44), an Italian painter, the son of Pietro Maria Pennacchi. He painted 'Virgin and Child with SS. Joseph, James, and Paul, and Patron, now in the National Gallery.

Trevisa, John de (1326-1412), and Regular other trevisa of Reg

English author, was a native of Corn-He translated for the fourth wali. Baron Berkeley, Higden's Poly-chronicon, 1387; Glanville's De Pro-prictatibus Rerum, and other Latin works.

Trevisani, Francesco, Cavaliere (1656-1746), was born at Capo d'Istria, near Trieste. He became the scholar of Antonio Sanchi at Venice. After some preliminary practice as a painter in the Flemish school he distinguished himself by several fine pictures. At Rome T. found a valuable patron in the Cardinal Flavio Chigi. His chief excellence consisted

35,000.

Trevithick, Richard (1771-1833),an English engineer, was born in Cornwall. He was one of the greatest inventors that ever lived, and after preliminary experiments com-pleted the first steam carriage to carry passengers at Redruth, 1801. The development of the high-pressure engine was also largely due to his inventions.

Trevor, Sir John (1633-1717), born Denbighshire. He was recom-He was recommended by Jefferys to be of the king's council, and master of the rolls in 1685. In May 1685, and again in March 1690, he was elected Speaker of the House of Commons. In the beginning of 1688 he was made a privy councillor. He was expelled from the House for accepting a bribe from the City of London. He, how-ever, retained the mastership of the rolls.

Trew, Christolph Jacob (1695-1769). a German physician and botanist; published Vasa Nutritia Foliorum Arbercorum, 1748; Herbarium Blackwellianum Auctum, 1750-60; Libro-rum Botanicorum Catalogus, 1752-57. Trial. Ts. of civil actions in Eng-

land respecting common law matters (i.e., generally speaking, breaches of contract and torts, see Torn) if tried in the High Court may be either before a judge and jury or by consent before a judge alone. Actions in the commercial list are tried before a judge alone (see Commercial Court). Actions involving accounts are assigned for T. before one of the three official referces. Actions touching matters of equity (q.v.) are tried exclusively before judges only; similarly in the case of bankruptcy mat-Admiralty causes are before a judge of the Probate, Divorce, and Admiralty Division with or with out the aid of nautical assessors (see EVIDENCE). Divorce petitions, undefended, are disposed of by a judge alone; if defended may or may not be tried before a jury. Plaintiff in an action must after delivery of pleadings (q.v.) give at least 10 days' notice of T. unless defendant agrees or has been ordered to accept short notice. If he does not give notice within six weeks after the close of pleadings, the defendant may himself do so, or apply to a master of the High Court to dismiss the action. the action be for trial at assizes, the in purity and brilliancy of colouring, notice must be entered either at the

the convenience and pockets of both parties and the majority of the witnesses. The master also has power to direct the mode of T., but in certain cases the parties have a right to demand T. by jury, namely, in actions of libel, slander, seduction, breach of promise, false imprisonment (q.v.). malicious prosecution (q.v.). In cases where the parties have no such right, the party who desires a jury should within ten days after delivery of notice of T. apply for an order at chambers to have a jury. If neither applies, the master can make what order he deems fit. County court order ne deems nt. County court actions may be tried before a judge and jury of eight men, or before a judge alone (see County Court, Internot Court). The right to begin at a trial depends upon the mode of the force of the force or the right of the force or the right. raising the issues on the pleadings so far as actions for debt or liquidated (i.e., certain or fixed) damages are concerned. The plaintiff will ordinarily begin in order to substantiate far as actions for debt or liquidated (i.e., certain or fixed) damages are concerned. The plaintiff will order to substantiate his affirmative pleas, but the defendant may gain the right if his defence contains none but affirmative pleas. In actions for unliquidated (which, generally speaking, all those in which parties can all those in which parties can a jury as of right) the pla always entitled to begin irrespective of whether the burden of proof lies upon the defendant. The right is a formidable one in a jury action, as the 'last word' (unless the other party calls no witnesses) rests with him who begins. It is a right of no great value where the judge sits alone. For the rules of evidence at a T. and shows three distinct lithological types.

For the rules of evidence at a T. and the difference between examinationin-chief, cross-examination, and re-examination, see under EVIDENCE, EXAMINATION, and LEADING QUES-An application for a new trial may be made on several grounds:

Battle. This mode of trial, which consists of the Kenper marls and was introduced into England by the Conqueror, was resorted to in civil per are practically barren of fessils, actions, 'appeals' of felony, and but the latter affords beds of gypsum

district registry of the assize town cases before the Court of Chivalry. or with the associate of the circuit. In civil cases, to avoid the possible In every action in every division of the High Court the place of T. is fixed by a master, who will endeavour to fix a place which will suit the court of the parties them to be considered by the court of the possible loss of one of the parties, the duel was fought by hired champions, but in military cases the parties them. selves fought until one was slain or gave in (when he was put to death) unless the king intervened. Where the blood relations of a murdered person 'appealed' (meaning in this sense accused) the supposed murderer. the latter, where the accuser was not the latter, where the accuser was not a woman, child, priest, or infirm person, could claim T. by C. with his accuser. The accused was hanged if vanquished, but if he killed his accuser or prolonged the fight from sunrise till dark he was acquitted. Owing to the principle of English jurisprudence that no law can be abrogated by mere desuctede, one Abraham Thornton accused of mur-Abraham Thornton accused of mur-der in 1817 revived this archaism of chivalry and challenged his accuser to T. by C. The appellant declined, and Thornton had perforce to be discharged. T. by C. was then hastily abolished by statute.

Triangulum, a constellation between

Triassic System, in geology, is the first of the three rock systems of the Mesozoic period. It constituted the upper half of the original New Red Sandstone before the elimination of the lower half as the Permian (q.v.) The system or Dyassic system. The system shows three distinct lithological types, viz.: (1) The marine facies of the Alpine Trias; (2) the semi-marine and semi-continental facies of the German Trias; and (3) the continental facies of Great Britain, S. Africa, etc. The three members of the original German

trial may be made on several grounds:

e.g. misdirection

tion of evidence,
jury, excessive d
plication is made
to the Court of Appeal within eight
days after the T. Criminal Ts. in
England at assizes (including the
Central Criminal Court) and quarter
sessions are held before a judge and (about 2000 ft. thick). The Bunter

for misdirection

system described before a judge and (about 2000 ft. thick). The Bunter

(about 2000 ft. thick). The Bunter

three formulas courts are developed, and the courts are developed ment in Cheshire and Warwickshire

sessions are held before a judge and (about 2000 ft. thick). The Bunter Engiand at assizes (including the system attains its greatest development of the sessions are held before a judge and jury. Petty offences are tried before a bench of justices of the peace or a stipendiary magistrate.

Trial by Combat, or Wager of Battle. This mode of trial, which was introduced into England by the Conguerer, was resorted to in civil ner are practically harmon of facelly and the Keuper of t and German Trias were probably laid down in irregular basins, and the Muschelkalk of Germany must have been was a punishable offence, while to formed when the waters of the Ger-estrike them was a crime. But their man hasin were in communication nower was undermined by Sulla. man basin were in communication power was undermined with the open sea. The grand development of the marine facies of the Triassic in the E. Alps consists of in full force until the time thick bedded limestones, dolomites, and calcareous shales. The system and carefrons shales. The System here is generally divided into four subdivisions, viz. the Alpine Bunter, the Alpine Muschelkalk, the Norian, and the Carinthian, none of which can be individually correlated with the German types, although the range in time is equivalent. The transition beds between the Trias and the Lias (the Alpine Rheetic beds) can be paralleled with the Rhætic or Penarth beds of Britain. These beds are very fossiliferous, and are sometimes designated 'Avicula Contorta' beds. The Alpine or marine type of Trias recurs in the Balkans, Apennines, Peru, Himalayas, Alaska, and Japan. The continental type of Triassic occurs in S. India, S. Africa, and in parts of N. America. The life of Triassic time was rich and varied. The animals was rich and varied. The animals include fishes (Dipnoids), amphibia, Peconand all classes of reptiles. teris, conifers, and cycads represented tified tn., encircled by walls, and its the plant life of the time, and the inhabitants (105,000) are noted for invertebrata embrace all classes, their manufacture of iewellery entinvertebrata embrace an classes.

Lamellibranchs, gasteropods, cephalopods, and crinoids were most abundant, and the Muschelkalk is rich in their remains.

Trichinosis, or Trichiniasis, a disease caused by the presence of the parasitic nematode Trichina spiralis, which is found chiefly in man, the pix.

the doors of San Petronia at Bologna.

Tribonianus (d. 545), a Byzantine jurist and official, born in Paphlagonia about the end of the 5th century. of Justinian.

Tribune (Lat. tribunus), the name given to officers of various descriptions in the constitution of ancient Rome. Of these the most important were the tribuni plebis, or Ts. of the commons. At first their power was small and they were only two in number, but soon they became formid-

and rock salt as well as building stone, abolish its decrees by their veto. A large part of Germany is occupied Their consent was also necessary for A large part of Germany is occupied! Their consent was also necessary for by Triassic rocks, the Bunter afford ing beds of dolomite and the Keuper sulla, and if any irregularity haplocal seams of coal (Lettenkohl) and pened in the state their power was beds of gypsum. The middle member of the German Trias—the Muschelipper of the German Trias—the Muschelipper of the German Trias—the British disturb the peace of Rome. Again, their persons were held sacred, and to interrupt them while speaking by. Pompey and Cotta, however, restored their privileges, and the office remained in full force until the time of Augusin full force until the time of Augus-tus, who conferred the power and office upon himself to make him-self more absolute. It was totally abolished by Constantine. The fixed number of Tz. was ten. Amongst other officers bearing the title were: 1. The tribuni militum, who com-manded a division of the legions. 2. The tribuni cohortium pratoriarum, who were entrusted with the person of the emperor. 3. The tribuni aerarii, who kept the money to de-3. The tribuni fray the expenses of the army. They were abolished by Julius Cæsar, but re-established by Augustus, who added to their number. 4. The tribuni voluplatum, who had charge of the amusements which were prepared for the people.

Trichinopoly: 1. A dist. of Madras, India, with an area of 3651 sq. m. and a pop. of 1,450,000. 2. Cap. of the above dist., 30 m. W. of Tanjore, stands on the Cauvery R. It is a for-

Tribolo, Niccolo (1500-50), an Italian sculptor, born at Florence. He and the rat, but also in the dog, cat, was employed at Rome, Loreto, and rabbit, etc. The parasite finds its Florence, but his best work was the way into man from infected pork execution of twelve bas-reliefs for which has not been properly cooked the doors of San Petronia at Bologna. The young forms are found to the cook of the c The young forms are found encysted in the muscular fibres of the pig, and when the cysts reach the intestines, the solution of the calcified capsule He superintended the compilation of sets free the parasites, which grow the Pandects, Institutes, and new code rapidly and reproduce in enormous numbers. The young triching then develop and bore through the intestinal walls, ultimately reaching the muscles, where they become encysted by the secretion of lime salts. They are then quiescent, and can only further develop by reaching the in-testines of another host. The acute symptoms of the disease are caused able and not only preserved the rights by the migration of the triching of the people, but could summon from the intestines. The early indiassemblies, propose laws, stop the cations are nausea, fever, and loss of consultations of the senate, and even appetite: later on exhausting diarrhæa may occur, together with delirium, swollen eyelids, and tenderness and nain in the muscles. The most decisive symptom is a pronounced y eosinophilia. . include purga-

is made in the this expedient contra-indicated. as all efforts

must be directed towards avoiding

exhausting the patient

Trichomanes, or Bristle Ferns, a genus of ferns many of which are very beautiful. T. radicans occurs in Ireland.

Tri-chromatic Printing, see PRINT-ING and PROCESS WORK. Triclinium, a Roman word used to

designate the company disposed on the three couches that were usually placed at table for the guests; each of these couches was so made as to seat three persons. The word was seat three persons. The word was used in this sense as a figure of speech. but it also more directly meant the room itself in which banquets were held, and the table and three sur-rounding couches. The houses of rich Romans were fitted with several triclinia to be used according to the

different seasons of the year. Tricolor, see FLAG.

Tricoupis, Spiridon (1788-1873), Greek author and statesman, studied in Paris and London, and became secretary to Lord Guilford in the Ionian Isles. During the Greek War of Independence he occupied various important positions, and in 1832 was minister of foreign affairs. He was thrice envoy-extraordinary to don, and in 1850 was minister to Paris. He was a friend of Byron, whose funeral oration he pronounced. His chief work was his History of the Greek Revolution, 1853-57. His son, Charilaos Tricoupis (1832-96), became a His son. Chariforeign minister at the age of thirtyfour, and prime minister 1886-90 and 1891-93. His policy was to develop 1891-93. His policy was to develop the resources of his country so as to create an army and a fleet, but unfortunately the circumstances of the time did not allow his schemes to be carried into effect. He was the foremost Greek statesman of his time. Tricuspid, see HEART.

Tricycle, see CYCLES AND Tridacna Gigas, sce CLAM. Trident, in classic mytlused as the symbol of sovereignty over the sea. sisted of parbs three sho meet at the p with the T. on ancient coins, such as those of Saguntum, and on the Sicilian coins of Hiero. Britannia carries a T. also to represent sovereignty over the sea.

Acts, passed in 1641 and 1694, was to ensure the frequent meeting of parliament. Charles I ruled for eleven years without summoning a parlia-ment; the result was that the Long Parliament passed the first Triennial Act, 1641, empowering the Chancellor, or in default the Peers, to issue the necessary writs, if the king failed to call a parliament for three years, or in the last resort, allowing the electors to proceed to choose their representatives. The Act was repealed in 1664 by an Act which provided that par-liament must not be intermitted for more than three years. In 1694 William III, assented to the second Triennial Act, which followed upon the declaration in the Bill of Rights that 'parliament ought to be held frequently.' In 1716 the triennial limit was increased to seven years. That period was reduced recently to five years by the Parliament Act, 1911. Trier, see TREVES. Trierarch, the captain of a trireme,

warship, among the ancient \mathbf{or} Greeks. At the time of the Pelopon-nesian War the state furnished the hull of the ship (ravererar) and the pay of the crews, but the equipment of the ships was at the cost of the Ts.. who also gave ἐπιθοραί, or additional

pay, to secure the best men.

Trieste (ancient Tergeste), the principal scaport of Austria - Hungary, situated on the Gulf of T., 70 m. E.N.E. of Venice. It consists of a new town and an old town. The Via del Corso separates the two portions of the city, which is also intersected by the Maria Theresa Canal. The city is the see of a bishop, and the principal trading port of the country, being the seat of the Austrian Lloyd Steamship Company, one of the largest in the world. The principal manufacthe world. The principal manufac-tures are leather, wax, and soap, whilst shipbuilding and iron-found-ing are carried on. The principal ar-ticles of expert are wool and woollen goods, sugar, paper, machinery, etc.. and the imports include cotton and cotton goods, coffee, coal, hides, and tobacco. fruit, coreals, and tobacco. The harbour is a fine one, and in 1910 was developed and extended. man colony the time of

he governit con- ment of Venice, and submitted to the with Austrian suzerainty in 1382. From Austrian suzerainty in 1382. From 1797-1805 it was held by the French, and from 1809-13 was part of the Illyrian provinces. T. was pro-claimed an imperial city in 1849. Trifolium, a genus of leguminous plants which includes some of the

and 14th

most valuable fodder plants, collec-

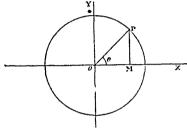
Triennial Acts. The object of these tively known as clover (q.v.)

Triforium, in Gothic architecture, greatly minimised by the use of the the space between the top of the following relations, it being only vaulting and the clerestory windows, when opened into the nave by a number of arches, three or less in each bay.

Triforium

Triglyph, in Greek Doric architecture, the upright blocks of the frieze, carrying the cornice above. Between the Ts. are the metopes (q.v.).

Trigonometry, in its primary meaning, signifies the measurement of triangles, but now it has a wider scope, embracing all types of geometrical and algebraical investigations by means of certain quantities termed trigonometrical ratios. These ratios are defined as follows: Take any system, of rectangular axes OX, OY and with centre O describe a circle of any radius. On its circumference take any point P. Join OP, draw PM perpendicular to OX. Then



clearly the co-ordinates of P are (OM, MP), or in ordinary cartesian notation (x, y), where x=OM, y=MP. If the angle POM be denoted by θ , then $\sin \theta = \frac{MP}{OP}$, $\cos \theta = \frac{OM}{OP}$, $\tan \theta = \frac{OM}{OP}$ $\frac{MP}{OM}$, $\csc\theta = \frac{OP}{MP}$, $\sec\theta = \frac{OP}{OM}$, $\cot\theta =$ omThe terms sin, \cos , θ , etc., are ÓP. abbreviations for sine, cosine, tangent, cosecant, secant, and cotangent. the above definitions the From following relations hold: $\sin \theta =$ $\frac{1}{\csc \theta}$, $\cos \theta = \frac{1}{\sec \theta}$, $\tan \theta = \frac{1}{\cot \theta}$. Also since OMP is a right-angled triangle, since OMP is a right-angled triangle, MP²+OM²=OP²... $\frac{MP}{OP}^2 + \frac{OM}{OP}^2 = 1$, i.e. $\sin^2\theta + \cos^2\theta = 1$. From these other relations, such as $\sec^2\theta = 1 + \tan^2\theta$ and $\csc^2\theta = 1 + \cot^2\theta$, may be deduced. As the line OP revolves the angle θ increases from 0° to 90°, 90° to 180°, 180° to 270°, 270° to 360°, and then moves through the same positions as before. In the construction of tables for the values of the different trigonometrical ratios of θ . different trigonometrical ratios of θ ,

necessary to calculate these values as θ takes the various values from 0° to 45°. These relations may easily be proved by reference to diagram, $\sin (90 - \theta) =$ $\frac{OM}{OP} = \cos \theta, \cos (90 - \theta) = \frac{MP}{OP} = \sin \theta,$ $\tan (90 - \theta) = \frac{OM}{MP} = \cot \theta$. The following also may easily be deduced: $\sin (90+\theta)$ $=\cos\theta$, $\cos(90+\theta)=-\sin\theta$; $\sin(180-\theta)$ $=\sin\theta\;;\;\;\cos(180-\theta)=-\cos\theta.$ $\cos 170 = \cos (90 + 80) = -\sin 80 = -\sin (90 - 10) = -\sin 10$. The addition theorem is useful in finding the values of the ratios of the sum or difference of two angles, the value of the ratios of these angles being known. The theorems are as follows, θ and ϕ denoting the angles:

 $\sin (\theta + \phi) = \sin \theta \cos \phi + \cos \theta \sin \phi$.

 $\cos(\theta \pm \phi) = \cos\theta \cos\phi + \sin\theta \sin\phi$. Often an angle is denoted by its trigonometrical ratio, this value is called the inverse function, c.g. sin-1! is the angle whose sine is 1, cos-1, is the angle whose cosine is 1. For the construction of tables, the sine and cosine functions are expanded into the following series: $\sin \theta = \theta - \frac{\theta^3}{12} + \frac{\theta^5}{12}$ -... ad inf., $\cos \theta = 1 - \frac{\theta^2}{12} + \frac{\theta^4}{4}$ ad inf., where θ is measured in radians. Thus if θ° is value of the angle in degrees, the number of degrees= $\frac{n\nu}{180}$ Trigonometry is applied to radians. the solution of triangles. These triangles may be plane or spherical, the chief relations existing between the sides and the trigonometrical ratios of the angles are: $\frac{\sin \Delta}{\sin B}$ sin C $a^2 = b^2 + c^2 - 2bc \cos A$, etc., Ċ where A, B, and C denote the angles, and a, b, c the sides opposite to these angles. In spherical triangles $\frac{\sin A}{\sin a} = \frac{\sin B}{\sin b} = \frac{\sin C}{c}, \quad \cos a = \cos b \cos c$ + $\sin b \sin c \cos A$; $\cos A = -\cos b \cos c$ + $\sin B \sin C \cos a$, the A, B, C, and a, b, c having the same significance as The subject arose out of the before. study of astronomy, the Greek astro-nomer Hipparchus (160 B.c.) invent-ing it. The man who greatly ex-tended the subject was Ptolemy, the Alexandrian astronomer. Regiomontanus made the subject a science quite independent of astronomy. See Plane Trigonometry by Todhunter (1897), Loney (1904): and M'Lelland, Spheri-cal Trigonometry, 1896. Trikkala, a tn. of Greece, cap. of the the labour of finding these values is

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maize, tobacco, and cotton, and the convulsion. see of an archbishop. Pop. 18,000.

Trillium, a genus of perennial plants (order Liliaceæ), with thick rhizomatous stems and roots, and a solitary nodding white, pink, or purple flower borne in the centre of a whorl of three leaves. T. grandiflorum, the wake robin, is often

grown in gardens. Trilogy, a group of three tragedies which are either connected by a common subject, or each is a distinct story. In Greece every one who took part in the poetic contest had to produce a T. and a satiric drama. The only surviving example is the Oresteia of Æschylus, consisting of the 'Agamemnon,' 'Choephore,' and ' Eumenides.

Trim, the cap. of co. Meath, Ireland, on the R. Boyne, 28 m. N.W. of Dublin. Its chief points of interest

of Dublin. Its chief points of interest are its ruined eastle and abbey, and a monument to the Duke of Wellington, once a resident. Pop. (1911) 1488.

Trimmer, Sarah (1741-1810), an authoress, was a great favourite of Dr. Johnson, and published: Easy Introduction to the Knowledge of Nature, 1782; Sacred History, 1782: 84; The Economy of Charity, 1786; The Story of the Robins, 1786; and Fabulous Histories, 1786; Fabulous Histories, 1786.

Trimorphism, see DIMORPHISM. Trimurti, the name of the Hindu triad, or the gods Brahman, Vishnu, and Sira, when thought of as an in-separable unity, though three in form. When represented, the T. is one body with three heads. The symbol of the T. is the mystical syllable om.
Trincomalee, a seaport on the N.E.

coast of Ceylon, with an excellent harbour. It is the site of the Tomple of the Thousand Columns, a pilgrimage resort; reduced to ruins by the Portuguese during the 17th century. Pop. 13,000.

Pop. 13,000.

Tring, a tn. of Hertfordshire, England, 32 m. N.W. of London. Here are Tring Park and the Rothschild Museum. It is engaged in silk manuf. and straw-plaiting. Pop. (1911) 4481.

Trinidad: 1. The second largest W. Indian island belonging to Brain. It lies off the N.E. coast.

Venezuela, from which it is separate by the Gulf of Paria. Area 1754 sq. r The N.E. and S. coasts are steep at lofty, with few harbours, but on the V the coast is low, and the Gulf of Par forms a vast harbour. From the W. the land rises gradually towards the interior, with fertile plains, hills, and valleys. Three mountain ridges traverse the island from E. to W., which may be regarded as continuations of similar ranges in Venezuela, of which

prov. Trikkala, 38 m. S.W. of Larissa. T. originally formed part, until de it is a centre of trade in wheat, tached by some volcanic or aqueous The climate is agree-The principal exports are sugar, cocoa, and asphalt; and cocoanut oil, rum, and Augostura bitters are manufactured. its features is Lake Brea, or the pitch lake, which contains an enormous supply of asphaltum. The island is supply of asphaneam. The armined drained by the Caroni, Oropucho (both navigable), Lebranche, Nariva, Guacaro, and the Hortoire. Port of (both navigable), Lebranche, Nariva, Guacaro, and the Hortoire. Port of Spain is the capital. Discovered by Columbus in 1498, T. became British in 1797. Pop. 370,000, mostly coloured. 2. The cap of Las Animas co., Colorado, U.S.A., engaged principally in coal-mining. Pop. (1910) 10,204. 3. A city on the S. coast of Cuba, 175 m. S.E. of Havana, exporting sugar and honey. Pop. 12,000. 4. A volcanic island off the coast of Brazil, to which it belongs. coast of Brazil, to which it belongs.

Trinitarians, or Redemptionists, a religious order, founded in Rome in 1198 by John of Matha and Felix of Valois for the redemption of Christians captive among infidels. The order followed the rule of St. Augus-

Trinité, La, a tn. on the island of Martinique, W. India; actively engaged in the shipping industry. Pop. (com.) 8000.

Trinity, in theology, the term used for the highest mystery of the Christian faith, the doctrine that the Divine Being consists of three persons Divine Being consists of three persons united in one God. In the O.T. this doctrine cannot be said to hold a prominent place, for the Jews had to learn the unity of God as opposed to polytheism. Not even in the N.T. is the doctrine of the Blessed T. found in its fully-developed form. This dein its fully-developed form. This development was the work of the early

centuries, and its expression owes

most of all to Greek thought. was first dis-Nicenc Creed 'ad I believe in itter part was

added pression comple ever, is

> igo, was nry VIII. illeges of was 324) and It was

founded for a master and sixty fellows, but the endowment was considerably increased by Queen Mary. There are numerous scholarships and exhibitions. See W. W. Rouse Ball's Trinity College (Dent).

Trinity College, Oxford, was origin-

priors and bishops of Durham. At and the Reformation it was suppressed but a new college was founded in 1554-55 by Sir Thomas Pope. This is the present college. The original foundation was for a president, worthern Africa, extending along the twelve fellows, and twelve scholers. twelve fellows, and twelve scholars, these last to be chosen, if possible, from the founders' manors.

Trinity House, the name of five

maritime societies, of which only one, the 'Corporation of Trinity House of Deptford Strond,' London, retains its ancient powers and privileges. The others, at Leith, Dundce, Hull, and Newcastle-on-Tyne, are now little more than benefit societies. London House, however, still retains the management of some of the most important interests of the seamen and shipping of England. Its corporation consists of a master, deputymaster, and thirty-one elder brothren, two of whom sit as assistants to the judge in the Court of Admiralty in almost all cases where any question upon navigation is likely to arise. There is also an unlimited number

of younger brethren.
Trinity Sunday, according to the
Western calendars, the first Sunday after Pentecost. In certain mediaval uses it was kept on the last Sunday

after Pentecost.

Trinobantes, a British tribe who were seated N. of the Thames, having London for their capital. In 43 A.D. and 61 A.D. they were overthrown by the Romans.

Trio, a term in music for a composition for three voices or instru-ments. It is also applied to the secondary movement of a march or minuet, and many other kinds of dance music.

Tripe, the paunch and smaller reticulum of a ruminating animal (especially sheep and horned cattle)

used as food.

Triple Alliances. The first was ratified between the States-General and England against France in 1668 for the protection of the Spanish ostrich Netherlands. It was afterwards skins. joined by Sweden, thus forming a stuffs, T. A. Another was arranged in 1717 Gove

ally founded and endowed by and this, together with the dual Edward III., Richard II., and the alliance between France and Russia priors and bishops of Durham. At and the triple entente between Eng-

Tripoli, an Italian territory of Northern Africa, extending along the S. shores of the Mediterranean from 11° to 25° E., and stretching backwards some 800 m. into the Sahara Desert. The coastline is more than Desert. The coastline is more than 1000 m. in length, but the greater part of it, especially to the W. of Cape Sciarra, is low and sandy, and thus quite unfit for harbourage. About the middle occurs the Gulf of Sidra, at the E. entrance of which is the port of Bengazi. There are no rivers of importance. The Atlas Mt. range breaks into two ranges as it enters T .. and these two, the Gharian and Suda ranges, run from W.N.W. to Suda ranges, run from which the E.S.E. Besides these there are several minor ridges. Among the Gharian Mts. much corn and fruit is produced, though a considerable part of this tract is used as pastureland. The most barren district is that around the Gulf of Sidra, to the W. of which stretch endless marshes. The country E. of this gulf is known as Barca (anci fertile and the W. Dur

this district was extensively colonised by Moslems from Crete. T. is an entirely agricultural country, possessed of no minerals but salt. Along the coast all kinds of tropical fruit, palms, olives, etc., are produced. Further inland are grown cereals, olives, palms, saffron, firs, almonds, dates, lotus, and the vine. Senna, tobacco, henna, castor, and carob beans are also cultivated. Cattle and sheep are numerous, especially in Barca, where much more might be done in the way of stock-rearing. Before the abolition of the over-sea slave trade, the principal commerce was in negro slaves for the mainlands of Turkey. The chief exports now consist of barley, esparto grass, cattle, ostrich feathers, ivory, sponges, and skins. Its chief imports are food-stuffs, cotton and metal goods.

Government .- During the 16th cenbetween England, Holland, and tury T. came under Turkish rule, and France against Spain, but after the in 1835 was made into a vilayet of accession to it of Austria in 1718 it the Ottoman empire. In Sept. 1911, was known as the quadruple alliance, however, Italy, which had long been In 1788 England, Prussia, and dissatisfied with its relations with In 1788 England, Prussia, and dissatisfied with its relations with Holland allied, and in 1795 England, Turkey, issued an ultimatum, which Russia, and Austria. About 1883 was immediately followed by war, an alliance was arranged between Germany, Austria, and Italy to in the beginning of October the whole check the power of Russia and territory was annexed. This annexafrance, Although this T. A. expired tion was recognised at the Treaty of in 1892, it has since been renewed output in Oct. 1912. T. is now being and extended for a number of years, administered under the Colonial Ministry. Its area is estimated at In grammar he established the difference of the d F. T. Marinetti ripoli. 1912.

Tripoli, a tn. of Syria in the vilayet of Beyrut, about 2 m. from the sea. In 1109 it was taken by the Crusaders. Its pop. is about 30,000.

Tripoli Mineral, Infusorial Earth, or Kieselguhr, is composed almost entirely of the siliceous remains of diatoms. Wide areas of it are now being laid down as diatom-ooze on the bed of the S. Pacific. It occurs in Virginia, U.S.A., in a bed 40 ft. thick. As 'Tripoli powder' it is used for polishing purposes, and is also used in the manuf, of dynamite, Tripolitza, the cap. of

Greece, is seated in a plain at tude of 3000 ft. above sea-k

Pasha in 1825. Pop. 11,000.
Tripes, The, the final examination for the honours degree at Cambridge University. The name recalls the three-legged stool (Gk. τρίπους) on which an 'old bachilour' sat when the senior bachelor for the year propounded to him two questions.

Triptolemus was, according to Greek legend, the son of Celeus and Metaneira, who dwelt in Eleusis. In return for the loving kindness of Demeter, T. founded her of |

his native city, besides

husbandry. Triptych (Gk. τρίπτυχος, threefold), a tablet, often used as an altar-piece, of three leaves, each painted, and so

can

af.

the

ms · of As its name implies, it was provided either side with three banks of ίται, oars, tites

ζύγιοι, the had t shorte the lowest tier. The crew numbered about 220, 174 of whom were oars-

men and 17 sailors.

Trisagion (from Gk. 70is, thrice, and ayor, holy), a doxology of the liturgy used in the Greek Church. Trismegistus, sec HERMETIC BOOKS,

Tristan, or Tristram, the hero of an intensely romantic Celtic legend. The scene of the story, which deals with the tragic and fateful love story of T. and the two Iscults, Iscult of Ireland and Iscult of the fair hand, is laid in Ireland and Brittany, but chiefly in Cornwall at the court of King Mark. Modern versions of the tale are Wagner's opera Tristan und Isolde, Matthew Arnold's Tristram and Iscult. Swinburne's Tristram of Lyonesse, and 'The Last Tournament' in Tennyson's Idylls of the King.

Tristan da Cunha, the general name of three islands. Tristan (16 sq. m. in area), Inaccessible Is., and Nightin-he S. Atlantic, 2000 m. W.

of Good Hope. They are tude of 3000 ft. above sea-it sessions and were populwas utterly destroyed by Ibrahim lated in 1909 by 95 inhabitants. See Pasha in 1825. Pop. 11,000.

K. M. Barrow's Three Years in

Tristan da Cunha.

Tristan da Cunha (d. c. 1536), a Portuguese navigator, set out on a royage of exploration with d'Albu-querque in 1506. Besides discovering the islands which bear his name (q.v.), he took possession of Socotra, and came home richly laden from an expedition against Calleut.

Tristram, see TRISTAN.

Triticum, a genus of grasses bearrinal cylindrical spikes.

vheat (q.r.).

or Kniphofia, a genus of (order Liliaceæ) with large plants grass-like leaves and tall spikes of red or yellow flowers. They are often grown in the garden, where in early autumn they are very brilliant and Some of the dwarf conspicuous. species are suitable for rock gardens.

Triton, dwelt, according to Greek legend, at the bottom of the sea with Poseidon and Amphitrite, his father and mother. Ho is represented as human to the waist and dolphin below, usually in the act of blowing a shell to calm the seas. He is represented as

Triumph, the highest honour ac-Triumph, the nightest notice corded to a victorious commander among the Romans. Only a dictator, consul, or practor holding the imperium or highest command was imperium or highest command was

wariare, not The honour

and Thoth.

Trissino, Giovanni Giorgio (1478-1549), an Italian poet, enjoyed the friendships of the Medici popes, Leo X. and Clement VII., who employed him on diplomatic missions

The honour with necessary expenses was granted by the senate, who assembled outside the city to receive the victorious general, still in command. The celeptore of the command of the comm

Trollope

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to the Capitol through the city; the closely allied family Turbinidæ by streets were decorated with garlands, the horny operculum. and the procession, headed by the senate and state officials, passed through crowds of spectators, who greeted it with cries of ' Io triumphe. After the head came trumpeters, then the spoils and trophies, and the is a cycloid. crowns presented to the general by provincial towns. Following these came the sacrificial bulls, captives in chains, lictors, musicians, and priests. Immediately behind was the triumcar, gilded, garlanded, and drawn by white horses; in this stood the general wearing the garb of the Capitoline Jupiter, the purple tunica palmata, and toga picta, the former decorated with palm shoots, the latter with golden stars. An ivory sceptre surmounted by a golden eagle was carried in the left, a branch of bay in the right hand. Over his head a slave held the golden crown of Jupiter. Then followed the soldiers. Arriving at the Capitol, solemn sacrifice was made, and general festivity followed in the city. When the When the senate refused to authorise a T., the general might undertake one on his own account to the temple of Jupiter Latiaris, or he might be granted an ovation (q.v.).

Triumviri were three magistrates constituted themselves supreme heads of the Roman re-The first triumvirate, public. board of triumvirs, was that of Julius Casar, Pompey, and Crassus (60 B.C.), and the second, and last, that of Aurustus, Antony, and Lepidus Augustus, Antony, and Lepiqus (43 B.C.). There were also triumviri nocturni, a board of three night watchmen, and triumviri capitales, who administered the death sentence.

Trivandrum, a tn. in Travancore state, Madras, India, 53 m. S.W. of Tinnevelli. Its chief buildings include Vishnu, and the Maharajah's college.

Pop. 58,000.

Troas, see TROY.

Trocar (Fr. trois quarts), a surgical instrument, triangular in section, and sharpened to a point. It is provided with a sleeve or cannula which fits closely round the sharpened portion. It is used for plunging into a cavity when it is required to draw off pus or other fluid, the stem being withdrawn so as to leave the cannula as a drainage tube.

Trochee, a metrical foot, which in the classical quantitative system consists of one long and one short syllable (--), and in the English accentual system of one accented and one unaccented syllable (4-).

Trochidee, a family of gasteropod

Trochilus, see HUMBING-BIRDS.
Trochoid, the curve traced by a fixed point in a circle which rolls on a straight line. If the fixed point is on the circumference, the resulting curve

Trochu, Louis Jules (1815-96), a French general. He exposed in his brochure, entitled L'Armée française en 1867, the crying need of military reforms. As governor of Paris during the melancholy siege of 1870, he made the best of inadequate recources.

Troctolite, a variety of gabbro, composed of anorthite and darkgreen olivine.

Trozen, a city of ancient Greece, situated near the coast towards the eastern extremity of Argolis. The modern name is Træzene, and here met a new National Assembly in 1827. Troglodytes, a general Greek name for 'cave dwellers,' who were be-lieved to dwell in the Caucasus and especially in Ethiopia, where they tended cattle and practised barbarous customs.

Trogus Pompeius, a Roman historian of Gaulish origin, who lived in Rome during the rule of Augustus. He wrote *Historiæ Philippicæ*, a history of the Macedonian empire down to the conquest by Rome of

the East.

Troilus, in Greek legend, the son of Hecuba and Priam, King of Troy, and is variously represented as slain in battle or taken captive by Achilles. Classical story knows nothing of the tale of faithless love which Shakespeare unfolds in Troilus and Cressida.

Troitsk, a tn. in the goy. of Oren-

burg, Russia, 310 m. N.E. of Orenburg. It is an important trade

centre. Pop. 23,500.

Troja, a tn. in Apulia, Italy, 14 m. W.S.W. of Foggia. Pop. 7000.

Troll, in Scandinavian folklore, kind of evil spirit or wizard. T Norse sailors also called the Greenland aborigines Ts.

Trollhattan, a tn. in the prov. of Elfsborg, Sweden, 7 m. S. of Veners-borg. The falls of Trollhättan, over 100 ft. high, afford water power for the surrounding factories. Pop. 7917. Trollope. The family of T. has its

place in the literary annals of England after Frances Milton (1780-1863) married Thomas Anthony T. in 1809. After a visit to America she wrote Domestic Manners of the Americans (1832), and numerous novels, including The Vicar of Wrexhill (1837), which had the honour of a caustic review by Thackeray, and The Widow Barnaby. One son of this marriage molluses, distinguished from the was Thomas Adolphus (1810-92),

a writer on many miscellaneous subjects, a journalist, and a novelist. Another, a more famous son, was Anthony (1816-82), who for many years was an official in the Post Office. His first work of fiction, The Machiner of the wings of Norway took place in the cathedral, which is not the post of the wings of the manuf. His first work of fiction, The Mac-dermots dermote 1847. was The

Warden. t volume l of the Barsetshire series, which con-cluded with *The Last Chronicle of Barset* (1867). The Barsetshire novels undoubtedly contain his best work. He published an Autobiography in 1875. A biography by T. H. S. Escott appeared in 1913.

Trombone, originally called the Sackbut, a brass wind instrument, which is in reality a trumpet of deep tone. It consists of a long tube, bent twice upon itself, the centre section of which is double, an inner tube backwards and forwards sliding within an outer one. By means of this every sound in the diatonic and chromatic scales within its compass is obtained in perfect tune. There are three kinds of T., the alto, the tenor, and the bass, and these in orchestral music are generally used together. Tromometer, see Seismograph.

Tromp, Cornelius van (1629-91), a Dutch admiral, a son of Martin H. T. With Opdam he shared in the defeat at Solebay (1665), but he had his revenge when in 1673 he held his own against the combined French and

English fleets.

Tromp, Martin Harpertzoon (1597-1653), a Dutch admiral, defeated a Spanish squadron off Gravelines in 1639, and the same year captured thirteen richly-laden merchantmen from Portugal and Spain. But in this country his name is respected for the country his name is respected for the many lances he broke with Blake in 1652-53. In June 1653 he was worsted off the N. Foreland, and in July he received a mortal wound during a fierce struggle with Monk.

Tromsö, horway, on an island of the same name. The chief occupation is febring nestiqually whaling. Pan.

fishing, particularly whaling.

7000.

Tron, or Trone, was a ponderous beam set up in the market-place of Scottish towns as a means of weighing heavy merchandise. A 'tron' ib. was in the early days worth 21 oz. but it was later equivalent to the standard 16 oz. The 'tron' system is

now obsolete.

Trondhjem (ancient Nidaros, also Throndhjem, and Gor. Drontheim), Thronaniem, and Ger. Dronnem, the third commercial port in Norway, and former capital, lies at the mouth of the Nid. on Trondhjem Fjord, 84 wing. The plumage is white and the m. E.N.E. of Kristiansund. Herrings, edges, copper, and train oil are the staple exports, and shipbuilding, fish-

one of the most celebrated in Scandlnavia. The importance of T. began to wane after the Reformation. Pop. 45,335.

Troop, in cavalry, a captain's com-

mand. Each squadron is divided into a certain number of Ts., usually into four, each containing about thirtytwo men. It is the cavalry unit in manœuvres. If there are only two Ts. in a squadron, the number of sabres in the T. is proportionately

increased.

Troopial, see TROUPIAL. Troost (1697 - 1750), а Dutch painter and engraver, born at Amsterdam; he was elected a burgess of that town in 1726, and died there. He concerned himself mainly with genre and portraiture, and there are numerous examples of his skill in the Hague Museum.

Tropæoleum, Nasturtium, or Indian Cress, a genus of annual and per-ennial plants (order Geraniacee) bearing brightly coloured flowers with a spurred calyx, followed by round, furrowed fruits. T. aduncum, Canary creeper, is usually grown as an annual against walls or on trellises and fences. T. najus and minus are the popular so-called nasturtiums of gardens. T. polyphyllum is the yellow rock Indian cress. The tuberous rooted species of T. are grown in pots under glass.

Trophonius, a Greek legendary architect, was the son of Erginus, king of the Boeotlan Orchomenos. Apollo, reputed by some as his father, slow T. after he had erected his temple at Delphi. Henceforward the oracle of T. was consulted in a cave near Lebadeia (Baotia).

Trophy (from Gk. τρόπαιον, and τρέπειν, to rout) was in classical times a memorial of victory set up at the spot where the enemy had turned. Shields, helmets, or standards were hung on an oak or olive, and as they were dedicated to Zeus Tropæus, it was a sacrilege to remove them.

Trophy Money, a duty formerly paid in England annually by householders towards providing harness, drums, colours, and other equipment

for the militia.

Tropic Bird (Phacton), a genus of tropical sea birds with great powers Tropics (from Gk. τρίπειν, to turn) are two parallel lines of latitude on the terrestrial globe, distant 23° 30' N. and S. respectively from the equator. Outside of the T. there is no point on the earth's surface over which the sun is ever vertical. The T. of Cancer to the N. is so called because at the summer solstice the sun enters the constellation of Cancer. Similarly the southern T. is called the T. of Capricorn.

Trossachs (i.e. bristled territory), a picturesque glen of Scotland, Perthehire, between Lochs Katrine and Achray. This rugged and narrow defile is about 1½ m. in length, and was first rendered popular by Sir Walter Scott in his Lady of the Lake.

Trotting. This form of horseracing is peculiarly American, though a great part of the best trotters in the U.S.A. aro descended through Hamblelonian from the English thoroughhred Messenger. So popular did T. become thirty years ago in America that it practically displaced the English form of 'nuning,' and it still holds the first place in that country. The fastest mile trotted in America was by Lou Dillon '1009' in 1 min. 58 sec. and the fastest.

(1906) in 1 The Horse, Encyclopædia Ameri-

cana, 1886. Troubadours (from Provencal trobador, connected with modern Fr. trouver, to find or invent) were the lyric poets of Provence, who contri-buted the finest poetry to Provençal literature. They flourished in the 12th and in the contiguous portions of the 11th and 13th centuries. Kings, nobles, knights, and mer-chants, monks, and soldiers were found in their motley throng. Alfonso II. of Aragon, our own Richard Cour de Lion, and the Counts of Poitou and Toulouse sometimes joined their ranks, whilst among the professional T., the names of over 400 of whom have survived, the more famous were Arnaut Daniel, Giraut de Bornelh, Peire Vidal, Bertrand de Born, and Arnaut de Meruelh. Passion and claboration and elegance of form— truly a curious and puzzling pair— are the salient features of their songs, which tell chiefly of love and adventures like Jaufré, but also of war like the Chanson des Albigeois, or of contemporary manners like Flamenca. If a T. could not make his own melody, he paid for the service of a jongleur.

Troupial, or Troopial (Icterus), a genus of birds with yellow and black plumage. The common T. or Brazilian hangnest (I. vulgaris) is a handsome bird which is sometimes kept as a pet; it learns to whistle tunes.

Trout, a name applied to various members of the Salmonidæ. The common or brown T. (Salmo fario) varies greatly in appearance, not only with individuals but at different seasons, and this variability has led some authorities to distinguish a number of sub-species. At midsum-mer an adult T. is usually brownish or olive in colour, with pure white on the belly and gold on the flanks, while the back varies from olive or pale The dorsal brown to nearly black. fin and sides are spotted with black and often also with scarlet. scales are circular, thin, and minute. When the spawning season begins in autumn all the colour disappears and the body becomes slimy to the touch. The head of the male T. is larger than that of the female, and the lower jaw bears a cartilaginous knob. It feeds on a large variety of food, different kinds appealing in turn. It is by cunning imitations of some prevailing fly that the fisherman makes his most cherished captures. The artificial hatching of T. is now carried on extensively, and lakes and streams can be stocked or replenished with the stocked or replenished with the are not too polluted. By hatching the heavy loss in is reduced to a minimum. (See PISCICULTURE.) The bull T. or

hatching the heavy loss in is reduced to a minimum. (See PISCICULTURE.) The bull T. or sea T. (S. eriox) most resembles the salmon in appearance and habits, though thicker in proportion to its length, and with larger and more numerous dark spots on the gill-covers and scales. The salmon T. or white T. (S. trulla) is a more elegant fish, and its fiesh is much more delicate in flavour. The habits of both are similar. The rainbow T. (Salmo trideus) of America has been introduced into many parts of the world; in Britain it has proved disappointing, but it is in New Zealand, especially in Lake Taupo, that it attains the greatest size, many tons being caught yearly.

Trouveres were the poets of Northern and Central France, corresponding to the more famous troubadours of the south. They flourished at the courts during the 12th and 13th centuries, eking out with music their unimpassioned and stereotyped songs.

Trouville, a tn. and port in the dept. of Calvados, France, on the estuary of the Seine, 9 m. S. of Havre, and one of the most frequented watering-places in France. Pop. 6400.

Trover, or Trover and Conversion, in law, the name of an old form of action which lay against any one who converted or appropriated to his own use any personal property, in which the plaintiff had either a general property as owner, or a special property as bailee. Since the Common

practically abolished the old common law forms of action, the substance only and not the form of the action has survived.

Trowbridge, a tn. of Wiltshire, England, 9 m. S.E. of Bath, famous for its cloths and kerseys. Pop. (1911)

11,822.

Trowbridge, Sir Thomas (c. 1758-07), an English admiral, was 1807), was brought up in the naval service under Admiral Hughes in the E. Indies. He took up the blockade of Alexandria, but resigned it to Sir Sidney Smith in 1799. In this year he was made a baronet. In 1805 he was sent to the E. Indies in the Blenheim with a convoy of merchant ships. His vessel was last seen near Madagascar, in a violent gale, and exhibiting signs of distress; and nothing was ever discovered respecting the fate of

Troy, Ilium, or The Troad (Τροίη, Τροία, Ιλιάς γἢ, or 'Ιλιον, ἡ Τρωάς), a famous city and dist. of Asia Minor, forming the N.W. of Mysia. The dist., usually known as 'The Troad,' was bounded W. and N.W. by the Ægean and the Hellespont, E. by a midge of Mt. Ida. S. by the Gulf of ridge of Mt. Ida, S. by the Gulf of Adramyttium, its coast-line extending from Lectum promontory (S.) to the R. Rhodius (N.) below Abydos. In classic legend, the earliest king of this country was Teucer, after whom the Trojans are called Teucri or Teucrians. His daughter married Dardanus, a neighbouring chieftain, hence Dardanidæ (sons of Dardanus) is another name for Trojans. were probably a Pelasgian race, possibly descended from Thracian emigrants. Dardanus was grandfather of Tros, whose son Ilus founded Ilium or the city of Troy (N.), the largest and strongest settlement in the Troad. The next king of T. was Laomedon, who was succeeded by his son Priam, in whose reign the famous siege of T. by the Greeks took place, to avenge the rape of Helen, wife of Menelaus of Sparta, by Priam's son Paris. This siege lasted Priam's son Paris. This siege lasted nearly ten years, and ended with the sack and capture of T. by a stratagem of the Greeks (c. 1181 B.c.). The story is told in Homer's Iliad, and part in Virgil's Encid, ii. Once considered purely legendary, it is now commonly regarded as historical in the main artifices the range of Helen. the main outlines, the rape of Helen, perhaps, representing some act of piracy. Among the chief Greek heroes of the siege were Achilles, Agamemnon, Menelaus, and Odystate and arrows to Their Western and Among the College were Achilles, Agamemnon, Menelaus, and Odystate and arrows to Their was the college with the college with the college was seus; and among the Trojans, Hector, Paris, and Æneas. The site of the ancient T. is marked by the Hissarlik mound. The explorations carried on

Procedure Act, 1852, which here by Schliemann (1870-90) and ically abolished the old common Dörpfeld (1893-94) brought to light much valuable information. Remains of some nine different cities were discovered, buried one beneath another, the earliest dating from about 3000-2560 B.C. Probably the Mycengan fortress, sixth in number from the first of all (c. 1500-1200 B.c.), was the Homeric T. There are traces of two Greek settlements (1000-1st century B.C.) and of a new Hion (1st century B.C.) and of a new Hion (1st century B.C. 500 A.D.). See Herod. v. 95, vii. 75; Strabo, xiii.; Leake's Travels in Asia Minor, 1824; Lechevalier, Voyage de la Troade, 1802; Joly, Benoit de Stc.-More 1802; Joly, Benoit et le Roman de Troie, 1870; Lydgate's Troyc-book, 1513; Dunger, Die Sage vom trojan Kriege, 1869; Gorra, Testi inediti di Storia Trojana, 1887; Grief, 'Die Mittelälterlichen Bearbeitungen der Trojunersage,' 1886, in Stengel's Ausgaben . . . der romanischen Philologie; Schliemann, Ilios, 1881; Troja, 1884: Hall, Mycencan Age, 1901; Dörpfeld, Troja und Ilios, 1902; Ridgeway, Ridgeway,

Early Age of Grecce, 1901.
Troy, the cap. of Renssolaer oo.,
New York, U.S.A., on Hudson R.,
5 m. from Albany. West T. on the opposite bank is connected with it by an iron bridge. Much water and steam-power is afforded. Shirts, sceam-power is afforded. Shirts, collars, and cuffs are among the chief

manus. There are Bessemer steel-works, Pop. (1910) 76,813.
Troy, François de (1645-1730), a French painter, born at Toulouse. He became a member of the French Academy, and was afterwards sent by Louis XIV. to Munich to paint a portrait of Maria of Bayaria. died in Paris.

Troy, Jean François de (1669-1752), a French painter, son of François de T. (q.v.), born in Paris. He the became director of French Academy at Rome, where his death occurred. The Louvre has some of occurred. his best pictures, while others are in the museums of Dijon, Orleans, and

Montpellier. Troyes, the cap. of the dept. of Aube, France, 104 m. E.S.E. of Paris by rail. The settlement once of the Tricassi. T. is noted for its Gothic cathedral of St. Pierre. Here in 1420 was signed the treaty granting the French crown to Henry V. There

are now thriving hosiery manufactories. Pop. 55,486.

(1810-65), a Troyon, Constant French painter, born at Sevres. He excelled as a painter of cattle, and there are pictures from his brush in the Louvre, the Wallace Gallery, and the Glasgow Municipal Museum. He died at Paris. Troy Weight.

The term probably

Truce 311

town of Troyes, in France. The term provender for beasts in the avoirdupois pound as 144 to 175. For medicines the troy pound is divided into 12 oz.; each ounce into 8 drachms; each drachm into 3 scruples, and each scruple into 20 grains.

Truce, a pre-arranged suspension of hostilities for a certain period between two opposing states or armies. During this period no advancement of ground or act of hostility is allowed. In active warfare, the exhibition of a white flag is taken as a symbol of submission, and the

opposing party cease hostilities.
Truce of God. see God's Truce.
Truck Acts. The objects of the
T. A. are: (1) To ensure the payment of wages in hiring contracts, in coin: and (2) to render illegal any provision in a contract for the payment of wages otherwise than in current coin. Historically the T. A. had their origin in 15th century enactments framed in loth cenear.

In loth cenear, the practice of the practice of the put an end to the practice of the practice of the practice of the practice of the paying workmen and labourers by tall in the N.D. the paying them in goods of a poor town communicates by rail with La quality, or by making practice of the paying them in goods of a poor town communicates by rail with La quality, or by making practice of the prac

make any deduction or set-off for goods supplied, either by himself or through any agent of his; and, further, contracts which attempt to specify the place or manner in which wages are to be expended are null and void. The Act of 1896 punishes employers who make contracts with workmen for any deductions from wages by way of fines, unless (1) the terms of the contract are contained in a notice kept constantly posted up in some conspicuous place; and (2) the contract is in writing and signed by the workman, and specifies the acts or omissions in respect of which fines may be imposed, and the amount of such fines. In any event fines can only be imposed for acts or omissions likely to cause damage or loss to the employer, cause damage or loss to the employer, or 'an interruption or hindrance to his business.' There are similar provisions in the Coal and Metalliferous Mines Regulation Acts. The principal exemptions from the T. A., apart from those impliedly stated above, are: (1) deductions (under above, are: (1) deductions (under artist-historian of the War of Indewritten contracts) in respect of

Trumbull originated from weights used in the materials and tools to miners, fuel, business. dard pound in 1495, and was excludered employed by the dealers in the precious metals, gems, and drugs, for education of children (including, The troy pound contains 12 oz.; each of course, payments under the ounce 20 pennyweights, and each National Insurance Act, 1911). See pennyweight 24 grains. Thus the MacDonnell's Law of Master and pound contains 5760 grains, and is to Servant; Smith's Law of Master and Servant; See also FACTORY AND See also FACTORT Servant.

WORKSHOP ACTS.
Truffles are underground fungi.
The British T. (Tuber estivum) is found just below the surface in beech and oak plantations in the autumn. When mature it is hard and black and warted externally. Inside it is mottled with white and yellowish brown. The T. used in France is T. melanosporum, and the garlic-scented T. of Italy is T. magnatum.

Trujillo: 1. The birthplace Pizarro and the centre of an agricultural district. 25 m. E. of Caceres, in Spain. Pop. 13,000. 2. A seaport, trading in cattle, dyewoods, mahogany, and fruits, on the Bay of manogany, and irints, on the Bay of Honduras, Central America. Pop. 4000. 3. The seat of a bishop and a university town, with ruins of the ancient Indian city of Grand Chimu, 310 m. N.N.W. of Lima, in Pern. Pop. 7000. 4. A state and its capital in the N.W. of Venezuela. The town communicates by rail with Lacouston the S.F. shore of Lake Vern.

Trullan, the name given to the council which was also called Quintisext. The sixth council was confined almost entirely to doctrinal In order to supply the

want, 211 bishops assembled in 692, in a hall of the imperial palace at Constantinople, called the Troullos. It is chiefly important as being the council in which was laid down the legislation of the East on clerical celibacy.

Trumbull, James Hammond (1821-97), an ethnologist and philologist, educated at Yale. He gave much time to the study of the Indian languages of N. America. He lectured at Yale University on this subject. His most important works are The Colonial Records of Connecticut, and The Best Method of Studying the Indian Lan-guages. He was Secretary of State to the U.S. government from 1861-Three American universities 64.

served as aide-de-caton. The largest si his pictures is in Yale College, but

the Capitol at Washington.

Trumbull, Jonathan (1710-85), an American patriot, rose to become governor of his native state of Connecticut (1769-84) after being county judge for seventeen years. During the War of Independence he enjoyed the confidence of Washington, who appealed to him as 'Brother Jonathan.'

Trumpet, a brass wind instrument. It consists of a long, narrow, straight brass or silver tube, bent twice on itself so that two of the parallel branches form with the third a kind of rectangle with rounded corners. The mouthplece is cup-shaped and the other extremity broadens out like a convolvulus. Besides the simple T. used in cavalry regiments, there are valve and slide Ts.

Trumpeter, or Psophia, a genus of S. American birds allied to the cranes. P. crepitans is a bird of lustrous and brilliantly-coloured plumage and is

often domesticated.

Trumpeter Fish, or Latris hecalcia, animportant food fish of Australia and New Zealand. It is finely flavoured and grows to a weight of 50 or 60 lbs.

Trumpet Fish, Snipe Fish, or Centriscus scolopax, a small fish widely distributed in warm seas and sometimes found off the S. coast of England. The snout is in the form of a tube.

Trunk-fish, another name for the

coffer-fish (q.v.).

Truro: 1. (The Treuru of the Domesday Book.) A city with a modern cathedral (1880), 111 m. N.N.E. of Falmouth, in Cornwall, England. There are tin-smelting England. There are tin-smelting works. Pop. (1911) 11,325. 2. A manufacturing city on Cobequid Bay, 61 m. by rail N.N.E. of Halifax, in Nova Scotia. Agriculture and lumbering are the chief occupations followed in the vicinity. Pop. 6400.

Trust, see HERNIA.

Trust: 1. Legal.—A.T. is an 'equitable obligation binding a person (who is called a trustee) to deal with property over which he has control (which is called the T. property) for the benefit of persons (who are called the beneficiaries) of whom he may himself be one, and any one of whom may enforce the obligation.' (Under-hill on Trusts and Trustees.) Legal historians for the most part trace the development of Ts. in English law through the doctrine of uses. In development of Ts. in English law ries' interest, are void (see also Restribugh the doctrine of uses. In all probability the Chancery lawyers, who were ever indebted to the principles of civil law, borrowed the whole idea direct from the Roman fidei property may be created orally,

(q.v.). Equitable estates . are not now ignored or y the common law (see t in construing a T. or

Declaration of Independence, and considering the powers or duties of three other great pictures now adorn trustee and beneficiary respectively, trustee and comencial respectively, it is necessary to observe that the trustee usually has the legal ownership of the T. property, subject, of course, to his fiduciary obligations; while the beneficiary has only the equitable ownership, though such ownership confers upon him the beneficial right to the income or other profits accruing from the property.
Any act or default on the part of a trustee which is unauthorised either by the terms of the instrument creatby the terms of the instrument creating the T. or by law is called a breach of T., in respect of which the beneficiary is entitled to sue for damages. The appointment of a public trustee may be made either by the creator of the T., by the person laving by the Trustee Acts or by the T. instrument power to appoint now or additional trustees when required, or by the court The public trustee is forbidden by the Public Trustee Act, 1906, to accept the responsi-Act, 1906, to accept the responsibility of certain Ts.; c.g. Ts. exclusively for religious or charitable purposes, Ts. for the benefit of creditors, and Ts. involving the management of a business. Ts. are said to be: (a) Express, when created intentionally by the act of the settler. Express Ts. are generally created by deed or will. They are the common means whereby owners of property provide for their issue on their own death or settle property on their chil-dren at marriage. (b) Constructive, when, though the legal title to pro-perty is in one person, the court will decree that he ought in equity to hold decree that he ought in equity to hold the property subject to the beneficial enjoyment of another. (See Contracts, and Frauds, Statute of.) All property, real (q.v.) or personal, whether situate at home or abroad, and whether in possession or in action (see Chose in Action), remain remai: (q.v.),

subjec. made it inalienable (e.g., pensions and salaries to public servants), or being land the tenure (see Tenure) is in-consistent with the Ts. sought to ecreated. The expressed object of the created. The expressed object of the T. must be lawful or it will be held void; hence Ts. conducive to immorality or fraud, Ts. restricting the power of alienation of the beneficiaries the property of the state of the beneficiaries in the state of the

not to employ writing.

2. Commercial.—A commercial T. is a combination of companies or individual traders designed to secure the monopoly of a particular market. From the fact that the U.S.A. is pre-eminently the congenial soil for the T., it is argued by the opponents of protection that a system of tariff duties necessarily results in the creation of an artificial wall behind which the T. springs up and prospers to the detriment of the small trader and the consumer. Where a given prohibitive duly does operate to keep out foreign goods and foster the development of the corresponding home industries, it is at least a plausible argument that the output of the latter in process of time may or must exceed the home demand, and unless this surplus can be 'dumped' on the market of a 'free-trade' country there is pro tanto no market for it. But if a ring of the largest concerns is formed by pooling the capital of each, this ring or T. can buy out all the small concerns, limit the supply of the particular commodity back until price to the fancies of T. The colossal can Standard Oil, the Steel, and Beef Ts. taken with the beef 'famine' of recent years is cogent evidence that

some such economic consequence flows from the formation of the T. The antipathy to the T. of the freetrader seems further justified by the been fough id the passing of the Anti-Sherman T. law is a sure indication of the hatred of

the T. entertained even in America.
To English eyes the effect of the T. on American politics is one of sheer corruption, the enormous wealth of the T. 'kings' enabling them to secure seats in Congress and shape legislation to their own ends; and council.

Perhaps it was not surprising that when Sir William Lever of Port Sunfounded in 1877 by the late Mr. light formed his Soap T. in England, the Daily Mail inaugurated and carried through to its own eventual discomfiture a campaign against Sir William of unparalleled vigour (see on this Advertisements). There ADVERTISEMENTS). can be little doubt that the customary fault on this occasion. Apart from

politics are not to be captured by commercial Ts. Trust Companies are those which Mediterranean fleet.

though it would be highly inadvisable are formed to administer any kind of trust, though in practice their business generally consists in managing trusts arising under mortgages given by corporations to secure an issue of bonds. They also carry on safe de-posit business; that is, they undertake to keep in safe custody valuables for customers to whom they rent safes for that purpose. The administrafor that purpose. The administra-tion of trusts by these companies, involving, as it necessarily does, remuneration for the duties of trusteeship, was in its inception distinctly contrary to the legal assumption of the gratuitous nature of individual trusteeships; and since they became an established feature, banks have perforce had to charge a fee for that office.

Trustee Stocks. A trustee, unless expressly forbidden by the terms of the trust instrument, invests the trust funds in his hands in: (1) The public funds in his hands in: (1) The public funds or government securities of the United Kingdom, or in any parliamentary stocks; (2) real or heritable securities in Great Britain or Ireland; (3) stock of the banks of England or Ireland; (4) India, 3½ and 3 per cent. stock; (5) securities, the interest of which is for the time being guaranteed by parliament; (6) corsolidated. teed by parliament; (6) consolidated stock of the Metropolitan Board of Works, or of the London County Council; (7) debentures or preference stock of any railway company in Great Britain or Ireland, provided such company has, during each of the ten years last past before the date of can politics by the Standard Oil and less than 3 per cent. on its ordinary Steel Ts.

American
heave stock; (8) debenture stock of any heave for the date of not can politics by the Standard Oil and less than 3 per cent. on its ordinary stock; (8) debenture stock of any heave for the date of the control of on which is guaranteed or paid by the Secretary of State for India (9) B annuities of the Eastern Bengal, E. Indian and Scind, Punjab, and Delhi railways; (10) stock of water supply companies in Great Britain or Ireland; (11) inscribed stock issued by any municipal borough having a population of over 50,000, or by any county

Henry Labouchere.

Trygon, see STING RAY.

Tryon, Sir George (1832-93), an English admiral, was in command of the first British iron-clad, the Warrior (1861-64). Director of transports during the Abyssinian expedition of 1867, accuracy of the Daily Mail was at he was afterwards commander-inchief on the Australian station (1884the personal integrity and tremend-ous popularity of Sir William Lever, the English electorate and English 87). At the time of his death, due to a fatal collision between the ill-starred Victoria and the Camperdown off Tripoli, the consequence of his erroneous command, he was in charge of the

Trypsin, one of the ferments secreted | burg (1881). In 1886 he was nominby the pancreas (q.v.): by its action albuminates are turned into tryp-tones or peptones. It is used in medicine, being administered in capsules, specially composed so as to pass into the intestines before solution.

Tsad, see CHAD, TCHAD, OR TSAD. LAKE.

Tsaidam (more correctly Tsadum). a Central Asian region, lying between N.E. Tibet and W. of the Koko-nor, formerly the bed of a vast salt lake.

Tsar, or Czar, a popular title of the Russian emperor, his wife being called 'Tsaritsa.' It has a common origin with the German 'Kaiser' in the Latin Casar.

Tsarskoye Selo, a tn. in the gov. of St. Petersburg, Russia, 15 m. S of St. Petersburg. It is a summer resort and contains two royal palaces. Pop. 23,000.

Tschaikowsky(or Tchaikovski), Peter Hyich (1840-93), a composer; settled in St. Petersburg in 1850, where ho joined Anton Rubinstein's new Conservatoire in 1862. From 1866-77 he was professor of harmony at Nicholas Rubinstein's Conservatoire at Moscow. An unhappy marriage then disturbed his life for a time, but in 1879 he was freed from the necessity of teaching, and withdrew to the country and devoted himself to composition. As a composer T. shows remarkable versatility: he attempted operas, e.g. Foyevode (1869), Eugen Onegin (1879), Muid of Orleans (1881), symphonics, chamber, vocal, and instrumental music, and in every branch he accomplished masterpieces, e.g. his 4th, 5th, and 6th symphonics, his string quartets. his plane concerts in B flat minor and violin concerts in D minor, and his splendid orchestral pieces, Francesca de Rimini and Romeo and Juliet. His genius was essentially national, and his music expresses all the mingled fire and melancholy of the Slavenic temperament. See Life by E. Evans (Muster Musician Series).

Tschudi, Ægidius, or Schudy, Gilles (1505-72), a Swiss chronicler, became landammann' or chief magistrate of his native state. His Chronicon helvelicum, 1001-1470, in spite of its character, uureliable ' remains

groundwork of Swiss history. Tschudi, Johann Jakob von (1818-89), a Swiss naturalist, spent five years in Peru and published valuable works on the antiquities and drama of that country, besides on its fauna (1844-47), and on his own travels there and in other parts of

S. America.

Tseng Ki-Tseh, Marquis (1839-90), a Chinese diplomatist, succeeded in winning back the province of Ili or Verbenacete) with racemes of funnel Kul as special envoy at St. Peters- shaped flowers.

ated at home to the presidency of the

Admiralty Board. Tseng Kwo-Fan (1811-72), a Chineso soldier, was largely instrumental in crushing the Taiping rebellion. Be-tween 1851 and 1862 he was busily engaged in clearing the provinces of Hunan, Kiangsu, Cheh-kiang, and Ngan-hui of the robels. Finally in 1864 be captured their stronghold, Nanking. His services were requited with the highest offices of state.

Tsetse Fly, or Glassina morsilans, fly belonging to the same family (Muscidæ) as the common house flics, and a cause of enormous loss among domesticated animals in Uganda and other parts of Africa. It is a blood-sucker, and though its bite is not itself dangerons, it is the means by which a parasitic protozoon is in-troduced into the blood causing nagana or fly-disease. The fly breeds in low-lying damp localities. similar in appearance to the house fly, and has a very long and slender ny, and has a very long this stender probosels. The wings are more leaden and more opaque, and the thorax is chestnut with four black longitudinal stripes. The abdomen is yellowish-white with a black spot on four of the five segments. Another species of the genus conveys sleeping slekness,

Tsimshians, or Chimmesyans, a tribe of N. American Indians, now almost extinct, who dwell along the shores of the Pacific, facing

Queen Charlotte Islands.

Queen Charlotte Islands.
Tsinan-fu, a tn. in the prov. of Shontung, China. The chief manuf. is silk, and it also trades in precious stones. Pop. 250,000.
Tsitsihnr, the cap. of a prov. in Manchuria, Chiua, on the Nonni. It is a penal settlement. Pop. 30,000.
Tsu, a tn. in Honshiu, Japan, 46 m. E.S.E. of Kyoto, Pop. 41,229.
Tsuruga, a tn. of Japan, 50 m. N.N.E. of Kyoto. It has a good harbour, and is an important trade centre. Pop. 13,000.
Tsushima, an island of Japan, situ-

Tsushima, an island of Japan, situated S. of Korea. At high water the ' both island ilt of being this n fleet anese

under
Tuam, a tn. in co. Galway, Ireland,
19 m. N.N.E. of Galway. It is the
seet of on Application and a Roman
Cathodrical of Physics 200.
Transport of State Phys.
Tubas, in music, tener and bras

wind instruments, valved, and c lusty tone.

Tube Flower (Clerodendron siphon anthus), a shrubby plant

terranean stem bearing minute buds

from which, after a period of sus-pended growth, a new plant arises. Tubercle and Tuberculosis. The tubercles which characterise the The the diseases classed under tuberculosis are the result of the attack of the tubercle bacillus and the defensive The bacillus operations against it. is a non-mobile organism, rod-like, with rounded ends. Koch, 1882, announced his success in isolating and cultivating it. The Lichtand cultivating it. and contivating it.

Nielsen method of staining is practically specific. Sputum on a cover glass is allowed to dry, and is then passed, glass downwards, three times through a spirit flame. It is then placed, film downwards, on a solution fuch in (1), absolute alcohol (10), 5 per cent. aqueous carbolic acid solution (100), and is then heated till it steams. After 3 to 5 minutes, it is washed and dipped in sulphuric acid (1 in 4); then rinsed in 60 to 70 per cent. alcohol several times, and finally with water; then counterstained with a 1 per cent. aqueous solution of methylene blue, giving red bacilli on blue. Koch cultivated it on coagulated blood-serum. The bacillus of the mammalian disease lives between temperatures of 29° C. to 42° C. flourishing best at 37-38° C. It is destroyed, generally, after 4 to 6 hours at 55° C; 15 minutes at 65° C; 5 minutes at 80° C.; 2 minutes at 90° C., and in less at boiling point. Its resistance to desiccation is very marked; if not exposed to sunshine it retains its virulence for as much as six months; exposure in direct sunlight kills it in a few hours. Metchnikoff studied the effect of the attack in the human body, determining the ingestion of the bacillus by leucocytes and the cells of connective tissue and of the lining of the alveoil. phagocytes throw off antitoxins, or absorb the bacilli, after they have been acted on by opsonins (Sir A. Wright). If the attack succeeds, leucocytes are destroyed and form Grey tubercle is the first and most characteristic lesion; it varies in size from a pin point to a small pea, and is slightly translucent, consisting of small and large cells containing bacilii. These tubercles gradually change to opaque, slightly granular, dry and frir ne yellow lubercles, which coalesce, increasing in size. Blood vessels are found in neither variety, but the lesions produce inflammation tissue, often

and abscess.

Tuber, the thickened end of a sub- | consistence of cheese; the caseous mass may then calcify and the disease be stopped; in small tubercles the change may be to a mass of fibrous tissue. The deposition of lime salts encloses the bacilli and kills them. In the case of suppuration and abscess, cavities with leaves discharge to further walls open weakened The attack and disease spreads. leucocytes themselves may migrate and spread infection.

Tuberculosis is infectious, and infection has been generally attributed as from other human patients, or from animals used for food, especially cattle and pigs. The chief means are inhalation of dried expectoration particles, or of wet particles, as in kissing or during coughing, or the ingestion of tuberculous milk or other fields. The question of identity of foods. tuberculosis of the bovine and avian type with that of man is not yet definitely settled. Koch is against identity, and Von Behring considers bovine bacilli more virulent in man. The Royal Commission interim report of 1904, and that of the Tuberculosis Congress in Paris, 1905, lean to Von Behring's view; the final report of the former, 1911, considers identity as true for bovine and porcine, but not for avian tuberculosis. The general tenet is that infection from milk is prevalent among children, and otherwise is due to overcrowding, parti-cularly of bedrooms, and neglect of isolation. Attention to these and the innumerable improvements due to greater prosperity in England have led to a fairly steady decrease in phthisis in males of 8.8 per cent, on the average in quinquennial periods since 1876; for the years 1909-11 the saving in life in tuberculosis, on a calculation from similar figures. amounted to over 170,000, or between 4 and 5 per cent. of the saving on all diseases. In 1904 the ratio of deaths from tuberculosis to those from all other chief acute infectious diseases was 60: 67; the disease also appears to act chiefly between the ages of twentyfive and forty-five. Among the causes of susceptibility to infection, physical over-exertion stands high; malnutrition and alcoholism also play a large part. Influenza, whooping cough, measles, and to a less extent scarlet and enteric fevers predispose to success of attack. Hereditary transis, of course, unprovintra-uterine infection mission is, of unproved, though known; hereditary predisposition is also quite uncertain. The disease being so widespread, so distributed vellow is due in age and sex, its latent period so of the grey tubercle and spreading till tremely difficult to collect correctly OXthe whole has the appearance and and much of the subject is still sub

country were made by Dr. Stukeley (T. trioxide). The metal can be obin the neighbourhood of Stonehenge. tained by reducing the trioxide on The remains found in the Wiltshire charcoal with hydrogen. It is a hard barrows indicate three distinct stages grey metal (melting point 1800) or eras of society. The first was be- sp. gr. 1911 and is used as an alloy fore the introduction of metals, when with steel to form self-hardening arms and implements consisted of steels. fint or bone; the second, when these articles were of brass; and the latest, when iron instruments, arms, and utcusils accompany the and deposit. Of the sepulchral urn, of which a great number have been found in the tumuli, there are two varieties, indicating different periods of mechanical art.

Tun, a variable measure of capacity formerly used for measuring e.g., a tun of wine = 252liquids. gallons.

Tunbridge, see Tonbridge.
Tunbridge Wells, a municipal bor.
and watering-place of Kent, England, 4 m. S. of Tonbridge. Its chalybeate springs were known in the time of James I. and were much frequented The Pantiles is in the 18th century. a fashionable parade there. ware (wood-mosaic) is manufactured, Pop. (1911) 35,703.

Tundra, a term applied to a geo-graphical region in N. Russia and Siberia, but now generic for all such Canada.

vhich by d conseis not

i is completely frozen, except for a depth of a foot or two during summer, at which season the surface water forms pools, lakes, and marshes, the formation of which has been largely determined in the larger features by the ice cap extending over it during the glacial age. The version in its during the glacial age, the version in its during the glacial age, the version in its during and scanty, extend which are its during an 'Alpine' flora. Except for the reindeer or caribou and musk-ox, the fauna consists of small furred animals, whose skins are sought hunters and trappers. In the N. the T. passes into arctic glaciated condition; its southern boundary coniferous gradually into merges forest.

Tung-Chang, or Tung-chang-fu, a tn. of Shantung prov., N. China, on the Tatein near the Grand Caual, 50 m. from Tsi-nan. It is an ancient city and an important mart for mer-

chandise.

Tung-kuan, a customs station of Shensi prov., China, on Yellow R. The main route to Central Asia passes

Tunguragua, a prov. of Ecuador, named from the snow-clad volcano of the same name, subject to violent eruptions, and one of the most noted peaks of the Andes.

Tunguses, the name given to a branch of the Mongolian, or Mongolo-Tartar, race, which dwells in the mountainous districts of Eastern Siberia. and the region drained by the R. Amur. The Tunguses number about 50,000. They are not confined to any particular region, but wander about from place to place in search of graz-ing for their flocks and herds. Thus they lead but a very precarious existence, and fall an easy proy to the cupidity of the Russian settlers. In common with most of the Siberian aboriginal races, they are test dimin-ishing in numbers. They profess the religion of Buddha, as do most of the Mongolian Siberlans.

Tunguska, the name of three rivers, Upper T. or Augara, Middle T. or Podkamenneya, and Lower or or Podskamenneya, and Lower or Nizhnyaya T., of E. Siberia, tribs of the Yenisei. The last and chief of the three (1630 m. long), in Irkutsk, Yakutsk, and Yeniseisk govs., rises near Kirensk and joins the Yenisei near Turukhansk.

Tunic, the Latin name of the principal undergarment of men and women, corresponding to the Greek nalla Women wore the chiton. over it, and men the 'toga.' It was with short of woollen material sleeves (if any), and reached to the knees in a man, to the feet in a woman. It was usually worn with a girdle, and was adorned with a narrow or broad purple stripe for a knight or senator respectively. The name is also applied to an ecclesiastical vestment, or to any short loose garment reaching from the neck to above the knee.

Tunicata, a class of mutine animals which is regarded as a degenerate

offshoot from the vertebrata

in their adult life, fixed to rocks or to the seabottom, occurring chiefly in the form of cartilaginous or leathery sacs. Many are joined into colonies, such as the various species of Betryllus form richly-coloured gela which form richly-coloured gena tinous incrustations on rocks and Tungsten (W, 184); a metallic element which occurs in nature as wolfram (fron tungstate), Scheelinite (lead tungstate), and wolfram ochro

attaches itself head foremost and extraordinary undergoes an

generation. a steel instrument Tuning-fork. with a base and two prongs which give a tone of definite pitch when made to vibrate by striking or bow-It is the most accurate standard of pitch, since variations due to rust, temperature, etc., are extremely slight. Usual pitches, A or C. Invented in 1811 by John Shore.

Tunis: 1. A dependency of France in N. Africa, lying on the Mediter-ranean Sea, between Algeria on the W. and Tripoli on the E., with an area of 50,000 sq. m., including that portion of the Sahara lying E. of the Djerid, extending towards Gadames. The pop., mainly Bedouin arabs, Kabyles, and Jews, is about 2,000,000. The surface is mountainous in the interior. The region in the neighbourhood of the region in the neighbourhood of the Mediterranean coast is fairly well watered and fertile, but towards the central table-land, bounding on the Sahara, the soil is very poor. The Sahara, the soil is very poor. chief industry is agriculture, the principal products being wheat, barley, oats, dates, almonds, oranges, lemons, shaddocks, alfalfa grass, cork, pista-chios, and henna. Much wine is made and olive oil is also produced. The mineral resources are steadily developed, and lead ore, zinc ore, phosphates, and iron are worked. The chief ports are Tunis and Bizerta, while there is good harbourage at Gabes, Sfax, and Susa. The native industries include spinning and weaving, saddlery, pottery, slipper-making, and matting. The fisheries are also important, being mainly in the hands of the Greeks, Maltese, and Italians. 2. The cap. of the above dependency, stands on a bay of the same name, surrounded by lakes and marshes, 10 m. from the sea, and 275 m. N.W. of Tripoli. Its port is Goletta. T. is a walled town, and its harbour is well defended. Velvets, silks, linen, and fez caps are manufactured. There are many mosques, and the houses are nearly all built of stone. Pop. estimated at 250,000.

Tunkers, see DUNKERS. Tunnelling. The art of T. is a very ancient one, and was on many occasions used and improved upon by the Romans, many of their rock-cut tombs and sepulchres being wonderful specimens of workmanship. The Mont

Cenis tunnel, the first to pierce the Alps, was a great advance in modern T. Rock-drills worked by compressed

green in colour, and conical with two with the excellent ventilation and orifices. Its egg hatches into a minute tadpole-like larva which, after a few hours' free swimming, and lessened the danger. The system and lessened the danger. The system and lessened the danger. and lessened the danger. The system adopted in England is to set out the centre-line of the tunnel on the surface of the ground. Shafts are then sunk at suitable points. From the bottom of these shafts the heading work is commenced in each direction. work is commenced in each direction. The top portion or heading is excavated and the crown bars and poling boards set in position; the size of the crown bars depending entirely upon the weight of earth to be supported. The heading is brought up to the requisite width, and all the upper timbers are placed in position. Sinking proceeds to the level of the bottom sill or timbers and the upper sill is supported by vertical props sill is supported by vertical props while raking shores are fixed. Sections are thus excavated of sufficient length to allow the centering to be placed in position, upon which the lining of brickwork is built. Upon the completion of one section, the crown bars are drawn forward to support the crown of the next section to be excavated. The thickness of the brickwork or other lining depends, of course, upon the weight of material to be supported. The system adopted in America consists in timbering the whole heading, the timbering remaining as the lining of the tunnel. Under the Belgian system, the top heading is first excavated, the upper cone being removed so as to allow the crown of the arch to be built. The arch is then underpinned and the side walls built up to the springing. parallel headings are structed in the German method and the side walls then built. When the upper portion of the heading is removed the arch is built, the centering being supported by the unexcavated material, part of which is left until the last for this purpose. It will be seen that the timbering is more economical than English in the system. Experience shows that sandstone is the easiest material to tunnel through, while igneous rock is the most difficult. The latter, however, requires no lining. Running sand is difficult and most dangerous tunnel through, and requires a great quantity of timber. All tunnels are constructed with a sufficient gradient to allow the water to drain off. sewer is also constructed down the centre of the tunnel under the surface, having inlets from gulleys on either hand. In some cases, an open channel is formed to carry the water away. In constructing tunnels under rivers and other waterways, the ordinary methods may be adopted air were used, and this fact, together so long as the earth or formation

above is impermeable to water. At consists of segmental castings to all times, however, water in large which are fastened steel plates form-quantities may be encountered, and ing a conical cutting surface. A pumping will have to be reso. to prevent flooding. Tunnel is 41 m. long, and longest in England. It was in of construction from 1873 to 1886, la heading which has been constructed Headings were driven from the shores and a lining of vitrified brick built in Portland cement was used. The gradients at the entrances are 1 in 90, lining is filled by growting under and 1 in 100 and the carter position. gradients at the entrances are 1 in 90, lining is filled by growting under and 1 in 100, and the centre portion pressure. See also GREATHEAD. See is level. The tunnel under the Mersey between Liverpool and Birkenhead was in course of construction from 1880-86, and is 1½ m. long. The gradients at the ends are 1 in 27 to 1 in 30, and the central gradient is 1 in 900. The cost pe all rolling stock an 2284. The Simplon in the Mediterranean, the Alps is 12‡ m. long, and was opened in May 1906, having been industry since ancient times. It under construction from 1898. This attains a length of 10 ft. and a under construction from 1898. This attains a length of 10 ft. and a work consists of two single-line tun-weight of 1000 lbs. nels, and is the longest tunnel in the world. There is a gradual rise of world. There is a gradual rise of 1 in 500 for 5½ m. from the N. end, when the gradient becomes 1 in 143 to the Italian end. There are cross-connecting tunnels between the two traffic tunnels every m. The trains are hauled through the tunnels by electric locomotives. While the work was being carried out, considerable difficulty was experienced by the inrush of springs of hot water. Brunel was the inventor of the shield system of T., and it was first used to construct a tunnel under the Thames near London Bridge in 1825. The lining of the tunnel was of brick-work, and the shield was pushed for-ward by screws as the work pro-The same system was adopcceded. The same system was adopted by Barlow in constructing the second tunnel under the Thames, but he lined the tunnel with cast iron. Greathead also employed this system very largely, and it is now generally favoured in constructing deep favoured tunnels, especially for electric rail-ways. It allows of a minimum of disturbance on the surface and at the same time greater speed is obtained in the work of T. The speed obtained for the construction of ordinary brickwork tunnels is at the rate of about 1 ft. per day, but the rapid speed of 6 in. per hour was obtained in constructing the Central London Railway Tube, a

throughout the v

shield consists of

about 2 in. large

equally round this casting, the heads pressing against the iron at the rear. The front of the

's fixed behind the is to the working rough a rectangu-

The men work in

n fish of the family Scom-lied to the mackerel. It is in the Mediterranean,

Tunstall, Cuthbert (1474-1559), an

Tunstall, Cuthbert (1474-1559), an English prelate and distinguished scholar, studied at Oxford, Cambridge, and Padua. He held several livings, was Master of the Rolls, dean of Salisbury, bishop of London, then of Durham, and keeper of the Privy Seal (1523). He was employed by Henry VIII. and Wolsey on diplomatic business abroad and formed a friendship with Erasmus. He a friendship with Erasmus, He accepted the royal supremacy in religion, but disliked the rotorms of Edward VI. and was deprived of his see (1552). Restored under Mary, he was again deprived under Elizabeth and died a prisoner at Lumbeth.

Tunstall, James, D.D. (c. 1710-72), a churchman and scholar, educated at Cambridge. He was the first to question the authenticity of the cor-respondence between Cicero and Brutus. His own works are mainly theological or political.

Tupac Amaru II., or José Gabriel Condorcanqui (1742-81), a Spanish-Peruvian revolutionist, grandson of Tupae Amaru and known as 'the last of the Incas.' He headed a rebellion against the Spaniards (1780), the Peruvians getting control from Cuzco to Lake Titicaca, but was finally captured and cruelly executed with most of his family.

Tupi-Guarani, the name of two important tribes of S. American borigines, extending from the * nazon to the Lower Paraguay and to the foot of the Peruvian Andes.

, one time there were numerous the cast-iron lining of the tunnel. A Jesuit missions, especially among series of hydraulic rams are spaced the Guarant. A corruption of the is spoken as the trade

Amazon region. The surpassed the other

civilisation.

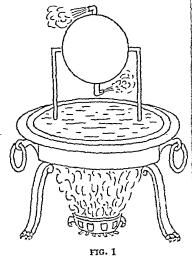
Tupper, Sir Charles (b. 1821), a Canadian statesman, born at Amherst, Nova Scotia. He studied medicine at Edinburgh and practised in his native town. He has occupied numerous important positions under the Canadian government, becoming premier in 1896, though but for six months.

Tupper, Martin Farquhar (1810-89). an English author, born in London. He published much poetry, including Proverbial Philosophy (1839-76), which was immensely successful, but is turgid and commonplace. T.s works, highly regarded by many in their day, are now rarely seen. His Autobiography appeared in 1886.

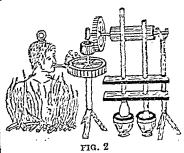
Turanian, a philological term applied to one of the great classes of human speech, including all the Turki peoples of Central Asia. It was then extended to almost every non-Aryan race in Asia and so ceased to have much value, and is practically obsolete.

Turbary, in law, common of Turbary is the right which a tenant enjoys of digging turf from the waste lands of a manor (see Common, Right of). Turbines. It is usual to refer to

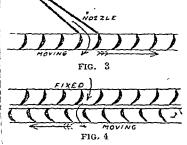
Hero of Alexandria, 120 B.C., as the inventor of the first T., sufficiently explained in Fig. 1. In 1649 A.D. Branca turned a wheel fitted with



Brazilian aborigines in culture and Hon, C. A. Parsons constructed a 6 horse-power engine, now in the S. Kensington Museum. The object orn at Am- of steam engines being to rotate a
He studied shaft, the reciprocating type is comparatively clumsy and complicated.



There are two chief reasons for its adoption and perfection before that of the simpler T.; the latter has had to await the development of metal-working tools and the scientific manufacture of metalfacture of metals of specially adapted properties, while in addition it is only possible with a thorough knowledge of the theory of heat and steam. T. are usually classed as impulse or In the former vanes or reaction. buckets, on a wheel keyed to the rotating shaft, are acted upon by steam from a nozzle, so designed as to allow expansion before reaching the buckets; the impulse, due to the high degree of kinetic energy thus developed, is thus the chief element in producing motion. The buckets are so shaped as to turn the steam gradually without shock backward.



In the reaction type the steam impinges on the buckets without exranes by means of a steam jet, Fig. 2. The steam at first curious that a really practical engine on this principle was not precise the produced in the contraction that the produced is the contraction that the produced is the principle was not provided with the produced in the produced with the produc not produced until 1884, when the chief factor in causing motion.

both types the kinetic energy de- naturally been deflected. The second veloped in the steam should, before ring of fixed blades is therefore interexhaust, be converted into useful posed, and these direct the steam of the steam work, and the difference may be expressed by considering the expansion in the reaction type to be spread gradually over the passage through a series of vanes. Figs. 3 and 4 illus-

trate the two types. trate the two types.

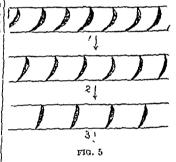
De Laval steam turbine.—In this, patented by Dr. G. de Laval of Stockholm in 1888, a specially constructed nozzle directs the steam on to vanes arranged in a single ring on the rim of a revolving cylinder. The vanes, shaped in section as shown in Fig. 3, are carefully and firmly fixed by also in schand sockate and held by placing in shaped sockets and held by Steam, which is packing pieces. superheated, enters by the pipe at the top, passes through the governorvalve chamber to the nozzle-chamber below; after passing through the spaces between the vanes it enters the exhaust-chamber (and thence to the condenser). The shaft of the wheel supported on bearings communicates by a pinion with the large heavy wheel. The nozzle can be regulated, as shown, by hand, and when the load is small, some can be shut off. The velocity of steam on issuing from the nozzle is very high, and as the best efficiency is obtained by working at wheel circumferential velocity equal to half this, very high revolution is demanded. This is revolution is demanded. This is often of 20,000 per minute, but can be reduced by steel double helical gearing to 2000. This speed is, however, altogether excessive for marine work, and the type is, therefore, not so used. It is much used for driving dynamos, being installed on ships for the purposes of lighting.

The Parsons steam turbine. nsist erou les. variable touching

methus of The form.

bladges, and the latter revolving or bladges, and the latter revolving or moving blades. The diameter of the spindile is less than the internal spindile is less than the internal diameter of the original threat the spindile is less than the internal annular space is left between the two Chis spin ace is occupied by the blades, and it is through these the steam flows. The steam enters the cylinder flows an entertie a ring of fixed guide and; it leads the steam is the condition of the conditi

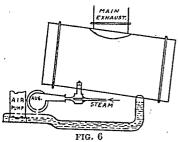
posed, and these direct the steam on to the second ring of rotating blades. The same thing occurs with succeeding rings of guide and moving blades ing rings of galax and moving make until the steam escapes at the exhaust passage. The guide blades give direction and velocity, 'the steam doing work on itself to produce velocity,' which is converted in the moving blades into useful torque. The diminished steam pressure results in expansion; the blade openings and the shaft diameter are all made larger in stages towards the exhaust. number of expansions is usually four in high pressure, eight in low pressure T., Fig. 5 showing the variation in blades in the last expansions of a low pressure engine. To secure end balance



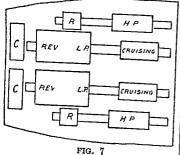
of the T. shaft at all loads, dummy pistons are fitted, and thrust bearings provided to keep the shart in correct rightways. The former, cam glands when the

through the easing, are into which thin edged

dummic through the interior of the rotor w the exhaust end, the labyrinth resultsuperheated steam, steel is used. Governing steam is admitted to the valve chest through a stop valve, and then through a runaway or emergency normally full open. governor valve itself is of the balanced double-beat type, operated by



steam relay controlled by a speed governor. The speed governor, driven by a worm and worm wheel mounted on the end of the main T. shaft, is regulated by hand to any desirable extent. Arunaway governor, mounted on the same shaft as the speed governor, is connected to the runaway valve, and set to come into operation should the speed rise by 10 to 15 per cent. above normal. whole action results in rapid blasts of steam being supplied to the nozzle, the flow being more nearly continuous the greater the speed of the



T. An arrangement is often made for introducing steam at initial pressure at some later stage towards the There is also an impulsereaction type of T.; an impulse wheel containing one, two, or three rows of blades being mounted at the high pressure end of a reaction T. In the jets the steam is expanded down to

bound by copper wire. For all parts heat extracted. Other types are the of the T. coming into contact with exhaust steam T., driven by exhaust steam from high pressure reciprocating engines, and the mixed pressure steam T. The latter has been fitted with gearing which reduces from 2000 revolutions per minute to 70 r.p.m.; the former with gear reducing from 3000 to 300 r.p.m. Condensers differ little from those used with reciprocating engines, but the exhaust pipe is of large diameter to accommodate the highly expanded steam; in marine steam T. perforated baffle plates of steel or bronze are introduced. Large air and circulating pumps are used.

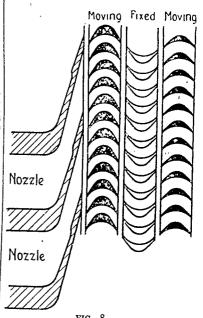


FIG. 8

A 'vacuum augmenter' has been designed by the Parsons Company to increase the vacuum over that obtained by means of the air pump. A small auxiliary is placed beneath the main condenser and connected by the main contenser and contraction a pipe with a conical contraction through which a jet of steam is forced. This exhausts most of the air and vapour, delivering it to the air pump, while a dip in the suction pipe forms a water seal preventing return, Fig. 6. Most large T. return, Fig. 6. Most large T. steamers are, however, fitted with the 'Weir' dry air pump.

Marine steam turbines. — In 1897 the Turbinia, the first T. steamer, 50 lbs, pressure and most of the super- driven by three engines, high pressure, intermediate, and low pressure, the high pressure rotors there were 72 driving three shafts each with three propellers, attained a speed of 34'5 heights of blades being from 2 to knots per hour. In 1900 the destroyer 5 in.; on the low pressure rotors, Viper attained 36'58 k.p.h. The first passenger vessel T. driven was the 32 to 11 in. In an eight hours' trial King Edward (1901), which made at 23,000 h.p., on Oct. 9, 1906, the 20'48 k.p.h. The Victorian and Virginian of the control of the c

20'48 k.p.h. The Victorian and Virginian of the Allan line were the first Steam pressure in bigh pressure, 157'5 Atlantic liners so fitted, and with 12,000 i.h.p. developed speed of 17 k.p.h. The Vacuum in the condensitient in 1905 the Caroni mania, both of 21,000 i.h.p., the 24,712; coal consumption per h.p. former a twin-screw quadruple expansion, the latter a triple screw T., The arrangement in battleships or with 4 low pressure engines, 2 ahead cruisers is shown in Fig. 7. At low or

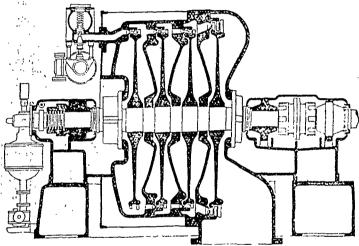


FIG. 9 (By permission of the British Thomson-Houston Co. (Rugby))

and 2 astern, and 1 high pressure moderate speeds the coal consumpahead in the centre; the T. was the better by a nautical mile per hour, but at high or maximum speeds the doing 21.6 k.p.h. on trial. The Lusisaving by T. is sometimes as much as tania and Mauretania, of the same 20 per cent. Ocean steamers with T. line (19 line (19 67,000 : with those fitted ngines. Cruisers ended a lass show a coal pressure aneau, 2 100 and 2 reversing T.

and 2 reversing T.

sure rotors are 188 in. in diameter, speed, this being much below that of the largest blades being 22 in.

height (see Engineering, Aug. 2 carried out tests fitted with T., forced capable of an average speed of prac- against three other similar vessels tically 26 k.p.h. The first battleship with triple expansion engines; the driven by T. was the *Drec*(1906), fitted with 1 high ahead, 1 high pressure aster:

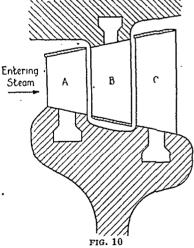
1 cach case was 3000 i.h.p. for 21.7 knots to the content of the conten much the same: at

pressure ahead, and 1 cruising

per cent.; at higher speeds still more. The Amethyst, moreover, had a radius of action of 3160 nautical miles at 20 knots as against 2140 by the others.

Curtis steam turbines.—This firm

has favoured the *impulse* type, obtaining efficiency at relatively low speeds by means of 'velocity' and 'pressure' stages. Fig. 8 shows the arrangement and form of nozzles and buckets, each row forming a velocity stage, part being absorbed in each. With no appreciable difference of pressure throughout the buckets, there is little end thrust in the shaft and no tendency to leakage of steam across the clearance space, which can thus avoid the danger of 'stripping.' Fig. 9 shows the 'pressure' stages, in this case four, the distribution of pressure being regulated by the size of the exhaust opening in each section, which also forms usually the nozzle for the next section. The are separated by steamsections tight diaphragms carrying the noz-zles, each one of which is so de-signed to utilise one quarter of the total steam energy from initial to exhaust, pressure, thus allowing exhaust pressure, thus allowing comparatively low speed of rotation.



18, the Amellyst showed a saving of 20 per cent.; at 20 knots, nearly 30 not subjected to the high temperaper cent.; at higher speeds still more. ture of the superheated steam. The The Amellyst, moreover, had a radius of action of 3160 nautical miles at 20 substantial wheel bosses and efficient diaphragm packings; in addition it is claimed that a shorter length of T. is obtained than in any other case. The moving buckets are of special bronze section, highly finished; they are dove-tailed into the periphery of the wheels and their outer ends covered and fixed by riveting on a shroud ring.

Governor.—This is of the centrifugal type and carried on a vertical shaft driven by a worm and wormwheel from an extension of the main T. shaft. It controls a small balanced pivot valve admitting oil under pressure to one side or the other of a rotary piston in a servo-motor, which is the real agent in controlling the main steam control valves, Fig. 11. Each control valve admits steam to a small group of nozzles in the first stages, and the opening and closing successively of several valves keeps a steam belt proportional to the load. The governor is adjusted to control the steady speed of the T. within 2½ per cent. from 0 to full load, and a hand wheel adjusts the compression of a balaxier of the transfer of the steady of the steady speed to the steady of the s of a balancing spring allowing a varia-tion of 5 per cent. above or below normal running. The motion of the governor is transmitted through the floating differential line to the piston valve admitting to one side of the rotary piston and closing the exhaust on the other. A cam is actuated by the shaft from the rotary piston, and operates poppet valves admitting steam to separate sections of the first stage nozzle of the T. An emergency governor cuts off steam should speed The T. are also become excessive. supplied for utilising exhaust steam at low pressure from existing reciprocating engines, and also as mixed pres-sure turbines for utilising in addition steam at high pressure from the boiler. In these latter, special high pressure nozzles are provided, which come into action automatically if the exhaust steam supplied falls to too low a pressure. The Curtis T. is also constructed with special governing devices for utilising steam at low pressures when the supply is at high pressure. The energy usually lost in a sure. The energy usually lost in a reducing valve can thus be usefully employed, and the T. also made to deliver the steam at the required low pressure. Many other types of steam cach expansion. Fig. 10 shows a T. are in use, notably the Rateau, single stage in diagram, A and C being the line of moving, B of fixed buckets, the gradation allowing for houckets, the gradation allowing for increased expansion with falling velocity. By expanding the steam in the taining a pan of water over which the parts, such as piston, slide valves, exhaust steam passes forms a regulator, etc.; steam is supplied direct to tor or accumulator, absorbing or deli-

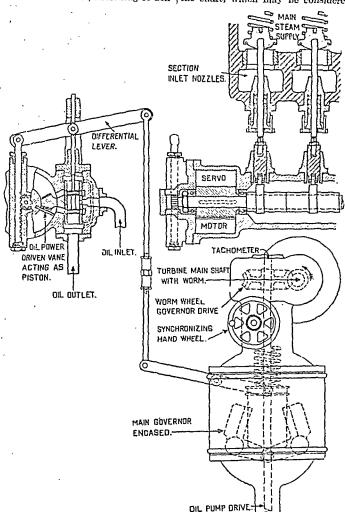


FIG. 11
(By permission of the Brilish Thomson-Houston Co. (Rugby))

vering steam as the exhaust pressure to rises or falls. The T. is largely replacing the reciprocating engine as a an prime mover. It has fewer working which ithout nt loss gor of Professor Jamieson, Steam and Steam Engines, including Turbines and Boilers; A. Jude, The Theory of the Steam Turbine; R. M. Neilson, The Steam Turbine, 1908; A. C. Thomas, Steam Turbines, 1907; W. Gentsch, Steam Turbine as Applied to Marine Purposes, 1906; Garnett, Turbines, Steam and Water, 1906; J. W. Sothern, Marine Steam Turbines; Dr. G. Bauer and O. Larche, etc., Marine Steam Turbines (trans. M. G. S. Swallow); Stevens and Hobart, Steam Turbine Engineering, 1906.

Turbot (Rhombus maximus), a flat

Turbot

Turbot (Rhombus maximus), a flat fish, which, like the brill, a member of the same genus, has the eyes on the left side, the ventral eye being anterior to the dorsal. It has no ordinary scales, but pointed tubercles

scattered in the skin. It is a shallow-water fish most abundant on the North Sea trawling grounds.

Turenne, Henri, Vicomto de (1611-75), a French general, second son of Henri, Duc de Bouillon, and of Elizabeth of Nassau. In 1630 he was sent by his mother as a hostage to the French court, in order to avert the designs of Richelieu against the sovereignty of his brother, the Duc de Bouil-lon, still a minor. T., whose reputa-tion for military science had preceded him, was, though only minoteen, ap-pointed to the command of a regiment of infantry. He distinguished himself at the siege of La Motte in 1634, and was appointed maréchal-de-camp. In 1635 T. was attached to Cardinal de la Valette who was to co-operate with the Swedes in Germany against Spain, and T. distinguished himself in the disastrous campaign that fol-lowed. In 1639, after some further service on the Upper Rhine, he was service on the Opper Linner, he was sent to Italy, second in command to the Comto d'Harcourt. T. was now ordered to Germany, where, during the winter 1643-44 he succeeded, by raising money on his own credit, in re-equipping the army which had been raised by the Duke of Weimar, and restoring its discipline. When the disturbances broke out at Paris, at the commencement of 1649, T. rejected the overtures of Mazarin, but, finding that resistance would be

break-down, less weight of machinery clared for the regent and Mazaring for the same power. The machinery is and accepted in 1652 the command of more compact, better balanced, and the royal army. From 1653 to the form marine work can be placed well conclusion of 1659 T.'s genius for war found ample scope in the campractically nil, and at high speeds paigns in the French and Austrian Notherlands, which were concluded Stodola, The Steam Turbine, 1905; Professor Jamieson, Steam and Steam fell near Sassbach, July 26, 1675, Engines, including Turbines and Wile preparing to lead his troops Notherlands, which were concluded by the treaty of the Pyrenees. He fell near Sassbach, July 26, 1675, while preparing to lead his troops into action.

Turi Laws, see Horse Racing. Turgai, a prov. of Russian Central Asia, general governorship of the of 169,832 sq. m. It has a dry climate, and the chief crops are rye, wheat, and the chief crops are rye, wheat, oats, barley, and potatoes. Salt is obtained from the lakes, and there are oil-works, tanneries, and flour-mills. Pop. 617,200.

Turgan, a tn. of Turkestan, situated S. of one of the largest chains of the Willey Shep. Mar. 200.

Turgeniev (Turguenev, Turgenev, or Turgenieff), Ivan (1818-83), a Russian novelist, born at Orci, of a dilapidated noble family, educated at Moscow, St. Petersburg, and Berlin. Incurring the displeasure of the czar, he left Russia in 1855, the rest of his uneventful life being spent at Baden and Paris with the Viardot-Garcia family. In Paris, where he lived after 1870, he became exceedingly popular, and it was through the medium of French translations that his works nrst became world-famous. His chief novels, to give the names of Mrs. Constance Garnett's very fine English translation (14 vols. 1894-97), are: Sportsman's Sketches, an exposure of the utter wretchedness of Russian serfdom (1846); A House of Gentlefolk (1859), On the Eve (1859), Fathers and Children (1862), his three finest works; Smoke (1867) and Virgin Soil (1877). Although his novels abound in typically Slayonic register. first became world-famous. His chief abound in typically Slavonic realism around in typically Siavonic realism and depression, T. must be regarded as the greatest Russian novelist. Fatalist and sceptic, he is yet free from cynicism, bitterness, or violent pessimism. As stylist and psychologist alike, he is perhaps the greatest prose-poet of human suffering. See Hammont, La Vie de Taurataist. Hammont, La Vie de Tourguénieff. 1910.

Turgot, Anne Robert Jacques (1727-81), a French statesman and economist, born in Paris, where his father occupied in turn various of the highest municipal positions. He was highest municipal positions. destined for the ecclesiastical pro-fession, but felt that he could not enter this state of life without hypovain, retired to Holland with some of circy. He, therefore, studied law, in his personal friends. T. returned to which from the beginning he showed Paris in May 1651, and having as he remarkable capacity. After holding said discharged his duty to Condé by various minor appointments, he was, procuring his release from prison, de-in 1761, appointed intendant of

Limoges, a province whose prosperity was then at the lowest ebb. On the death of Louis XV., a wider field was opened for his enlarged and benefit was opened for his enlarged was opened f ficent policy, and he was rapidly raised to the position of Controller-By a series of enactments. General. some of which were repealed imsome of which were top-cated mediately after his removal from office, he aimed at destroying the servitude of the mangant place of removing the

the townsmen who had lived by these abusesnobles, courtiers, financiers, farmers of the revenue—now united in a con-spiracy against him which Louis XVI. was too weak to resist. In 1776, having held office for only twenty months, he was dismissed. For the months, he was dismissed. For the rest of his life he lived in retirement, devoting himself to physics and mathematics, literature and poetry. He published various works on economics and literature, See Lavergne, Economistes français au 18° siècle (1870), and Lives by Condorect (1786) and Neymarck (1885). Turin (It. Torino, ancient Augusta Taurinorim): 1. A prov. of Piedmont, N.W. Italy, 3951 sq. m. in area. Pop. 1,213,709. 2. Cap. of above and chief city of Piedmont, at the junction of

city of Piedmont, at the junction of the Dora Riparia with the Po, 78 m. W.S.W. of Milan, in a fertile plain surrounded by the Alps. It contains an ancient castle and several modern palaces, a 15th - century cathedral, and the mausoleum (Superga) of the House of Savoy near by. Its uni-House of Savoy near by. Its university (founded 1404) is the chief in Italy next to those at Naples and Rome. There are fine museums, picture -galleries, and academies. the Crimean monument, the Cayour (1873), Amadeus VI. baldi, and Duke Enmanuel bert. T. is of great strate; portance and a good railway. The chief manufactures are and fabrics of all kinds, leather, glass, and machinery mortant under Amadeus V. (1418) and the Gobi portant under Amadeus V. (1418) and the succeeding Dukes of Savoy, it was held by the French from 1506-62, tinental, and blinding sandstorms are continually sweeping over cities and After Marengo (1800) it was annexed slitting up lakes and the beds of to France, became capital of Sar-dinia (1814-60), and of all Italy (1860-65). Pop. 427,733. See Promi, Sloria dell' antica Torino, 1869.

Turkestan, a tn. of Russian Central Asia; 176 m. N. of Tashkend. Has a citadel and the mosque and tomb of Azret. Trades in hides and wool. Pop.

15,000.

and Turkomans together make up the comparatively sparse population of 6,250,000, whilst the 1,200,000 inhabitants of Eastern or Chinese T. are quite half of them nomadic. Geographically, T. describes those regions of Central Asia which are shut in by Siberia to the N., Mongolia and the wide desert of Gobl to the E., Tibet, India, and Afghanistan to the S., and westward by the Caspian. Russian T., which has an area of 400,770 sq. m., is now subdivided into the provinces of Ferghana, Syr-Daria, Semiry-echensk, and Samarkand. The Alai and the Trans-Alai, 'the ramparts of the Pamirs,' the Ala-tagh, and the Tian Shan are the highlands to the E. and S.E.: the last range completely dwarfs the Alps, and individual summits in T. rise as much as 23,000 ft. above sea-level. Amu-Daria (or Oxus) and the Syr-Daria (or Jaxartes) are the chief rivers and are respectively 1500 and 1350 m. long. The country is interspersed with stoppes, deserts, salt marshes, and great lakes like Lake Aral and Lake Balkash, which are fast shrinking in consequence of rapid dessication. Silk, cotton, grapes, melons, and tobacco are the chief products from the many fertilo oases like that of Samarkand (30,706 inhabitants). Tashkent, the capital (201,191) in Syr-daria, and Khohkand (112,428). Namangan (61,388), and Andijan (74,316) in Ferghana, as well as Samarkand, are picture galleries, and academies. One and an important cortons, and Among its monuments are the Mole carpets, spices, silks, cottons, and Antonelliana (finished in 1889 as a indigo, etc. Eastern T. also called museum in honour of Victor Emmanuel II.), the Mont Cenis Tunnel by the Chinese Sinklang, is a high monument erected to its engage monument. The Colonest monument of the colonest three colonest the colonest three c one and all important entrepôts for m. Roughly to basin of the an area chich is barren

> tinental, and offiding sandstorms are continually sweeping over cities and silting up lakes and the beds of streams. Wheat, barley, maize, and tobacco, etc. are plentifully grown in the lowland oases. Higher up are excellent pastures for sheep and horses. Khotan (40,000 inhabitants) and Kashgar (33,000), the capital, are famed for their orchards, Other importants, cities are Varland important cities are Yarkand (100,000) and Kulja (150,000), which

province is a composed of

Karakoram

Geography .- T., or the Turkey: Ottoman Empire, now comprises European T., T. in Asia, and the vilayets or provinces of Tripoli and Barca (Benghazi) in N. Africa. All that is left of European T. is a parrow strip of the Balkan peninsula, stretching across from the Black Sca to the Adriatic and confined on the N. by Servia and Bulgaria; on the E. by the Black Sca and the Bosporus; on the S. by the Sca of Marmora, the Except Sca and Greece, on the W. the S. by the Sea of Marmora, the Ægean Sea, and Greece; on the W. by the Ionian and Adriatic seas, and on the N.W. by Montenegro and Bosnia. T. in Asia is now the true centre of gravity of the empire; it includes Anatolia (the great plateau of Asia Minor), the lowlands of Mesopotamia, the highlands of Kurrickian and Armenia a coastal strip in distan and Armenia, a coastal strip in N.E. and W. Arabia, and the island of Samos. The total area of the empire has been estimated at 1,565,000 sq. m., only 65,350 of which lie in Europe. m., only 65,350 of which lie in Europe. The following is a sketch of the geography of T. in Europe (for a description of the other parts of the empire, the reader is referred to Asia Minor, Tripoli, Syria, etc. The island of Crete is practically independent of Turkish rule). T. in Europe is a mountainous country. The Rhodope Mts., or Despoto Dagh (highest point Rilo Dagh, 9000 ft.), are a formidable barrier between eastern Thrace and western T., so that the one line of western T., so that the one line of communication is along the coastal plain. The wild and inaccessible high-lands of Albania in the W., which reach their greatest elevation in Schar Dagh (9000 ft.), form part of the Dinaric Alps. On the Grecian frontier in the S.W. is the Pindus range. The chief rivers are the Maritza and Vardar. The former discharges into the Egean, and is navigable as far as Adrianople, where it is joined by important affluents, and where, moreover, the highways over the Balkan passes converge. After cutting a passes converge. After cutting a passage through the Despoto Dagh spurs, it distributes its waters over Eastern Roumelia. The Bosporus, which guards the approach to the Black Sea from the Sea of Marmora, and is at the same time the focus of all maritime trade between the Mediterranean and Russia, etc., as well as of the overland routes from Europe into Asia Minor, has fitly been likened to a tortuous river valley over whose

are important trading centres for mountainous regions tropical sumcaravans passing to and fro from mers are followed by almost Arctic China, Russia, and Western T. winters. The weather is much more equable along the sheltered valleys of Albania, whilst on the Ægean shores it may fitly be described as balmy and sub-tropical as well as equable. and sup-tropical as well as equable. The soil is remarkably fertile, but owing to the primitive methods of cultivation and to the indolence of the inhabitants the yield is not nearly so great as it might be. In Albania cherries, apricots, and apples are profitably grown, whilst on the slopes of the supply southern valleys are of the sunny southern valleys are of the sunny southern valleys are groves of lemons and myrtles, palms and olives, oranges and figs. Beautiful rose gardens flourish up and down the Maritza valley, and mountains and hills are clothed with beech, ash, lime, and oak forests. Little toil is needed to raise abundant crops of maize and harley wheat rice cotton is needed to raise abundant crops of maize and barley, wheat, rice, cotton, and tobacco. Albania is noted further for its wool, sheep-rearing being an important industry, and also for its silk and honey. The upland pastures are freely used for stock-farming. In spite of antiquated methods, the fisheries are very profitable, and those of the Bosporus alone are worth more than £250,000. Minerals are still quite undeveloped, what little mining there is being controlled by mining there is being controlled by foreign capital; yet there is every reason to believe that iron, lead, and other metals exist in plenty. Some chrome ore is annually exported. Manufactures are equally backward and bard learn cotton treatments. and hand-loom cotton weaving is almost the only one of importance, though there are silk factories both in Constantinople and Salonica, and there is still some traffic in shawls, leather, and the world-famous carpets. The chief exports for the year 1906 in order of value were cocoons, mohair, figs, coffee, raw silk, barley, and opium, whilst the imports for that year were sugar, flour, rice, licen retraleurs of the controllers of the c that year were sugar, nour, rice, linen, petroleum, coffee woollen stuffs, and cashmere. For 1910 the total value of goods exported was estimated at £16,378,602, and of goods imported at £30,043,300, both these figures showing a slight decrease on the corresponding estimates for 1908. figures showing a sight decrease on the corresponding estimates for 1908. T. does most trade both in imports and exports with Great Britain, and next with France and Austria-Hungary. She received in 1910 over £5,000,000 worth of cotton goods from the United Kingdom, this being more than five times as much as the more than five times as much as the amount of woollen goods, which, wooded banks are scattered forts and towers, cities and villages, castles and parks. The southern gate of the sea of Marmora is the Dardanelles, which gives an opening into the Ægean. The climate is variable. Thus in the

shipping the record of T. is no better | Adrianople (83,000), which by reason than it is in the industrial world. In 1911, 963 sailing vessels and 120 steamers comprised the whole mer-cantile navy. Indeed, the carrying trade is practically in the hands of foreigners, especially of the British, Greeks, and Italians. According to tonnage statistics for vessels entering Constantinople, the home shipping is not a twelfth of the British.

Internal communications. — The railways have made great strides in recent years. Constantinople is now in direct communication with Salonica and Monastir by means of a coastal line and with Sophia, Nisch, and Belgrade by means of a line passing up the Maritza Valley, through Adrianople and Philipopolis, and thence over a pass between the Balkans and Rhodope Mts. Rhodope Mts. Salonica is further united with Uskub and Mitrevitza. Improvement schemes for railroad connections are now (1913) under consideration. There is an electric tramways service in Salonica. postal and telegraphic services are a long way behind those of other European countries, and foreign nations still find it necessary to maintain their own post-offices in the large towns and ports. The roads are discreteand ports. The roads are disgrace-fully neglected, and are so bad that whole districts are prevented from sending their products to the markets.

Defence.—The peace strength the army is estimated at 375,000 for all arms and ranks. Military service has long been compulsory on Moslems, but since 1909 Christians have been allowed to serve, and as the latter exceed the former in European T., the military responsibilities of the Moslems have been very considerably lightened. Liability to serve lasts for twenty years, the recruit passing into the first line or 'Nizam,' and thence to the second line or ' Redif,' and finally for two years into the 'Mustafiz. the 1910-11 budget £6,971,012 was yoted for the war ministry. The navy reorganised under In 1911 there were now being British officers. three dreadnoughts, seven pre-dreadnoughts, three cruisers, eight effective destroyers, and fourteen torpedo-boats. Adrianople is the principal fortress. Constantinople is protected the lines of Chekmedye and Salonica by batteries. Dardanelles and Bosporus are both fortified.

Population and towns.-In Europe Population and towns.—In Europe there are over 6,000,000 people, this being a little less than a quarter of the total rumber of inhabitants in the empire reclusive of such nominally subject states as Crete and Egypt). Of the towns by far the most populous is the capital, Constantinople (1,200,000), whilst after it come of its central position in the Maritza valley commands an extensive inland commerce, Midia, and Gallipoli, the chief port on the Dardanelles.

Constitution and government.—The whole empire is split up into vilayets or provinces. Thus the vilayets of Janina, Scutari, and part of Monastir form the somewhat savage Albania; that of Kossovo in the N.W. corresponds with Old Servia; Macedonia is made up of the vilayets of Salonica and the rest of Monastir, which contain some of the best mineral and agricultural wealth of T. in Europe, whilst so-called Eastern T. is divided into the vilayets of Adrianople and Constantinople. Constantinople. Sanjaks, as, for instance, the Sanjak of Novi-Bazar, which lies between Servia and Montenegro and was long subject to a military occups are district

turn are which are villages.

been the only form of government practised in T., for the excellent constitution decreed in 1876 by Sultan Abdul-Hamid II. was set down on paper and that was all. After various civil upheavals and revolutions consequent on shocking and persistent misrule, an attempt was again made in 1908 to build up a fresh constitution on western lines, that is with a Senate and a Chamber of Deputies, having a large electorate composed of citizens of all races and creeds, and with recognition of freedom of worship, freedom of the press, etc. In 1839 a complete code of laws was drawn up on the basis of the Napoleonic code. and this is administered by the 'Nizamic' courts, whilst the Sheri courts deal with the majority of civil suits. The true bedrock of Turkish law, however, is the 'Koran' and the 'Hadith' which likewise contains the bylement the judgment

Religion, raestablished though in Eu 2,500,000 Moslems to 3,500,000 Christians. Among the latter Orthodox Greeks, Armenians, Roman Catholics, and and are under the etc., pro-ews. The Exar Jews. domi: want of uniformity in religion is perhaps the gravest obstacle in the way of building up a consolidated and homogeneous empire, and side by side with this deficiency may be noted the violent cleavages consequent on the multiplicity of races which are which seem

to be filled up after it come to allow of a truly national T. Thus

themselves. some 70 per cent. of the total population, the remainder being made up of Slavs (Bulgarians and Serbs), Rumanians, Cherkesses, Armenians, Jows Gipsies, and Circassians. Edu-Jews, Gipsies, and Circassians. Education is still only rudimentary, the majority of the well-educated Turks being sent abroad to school. The elementary schools, which theoretically at least must be attended by all boys from six to eleven years of age, and by all girls from six to ten, are free and under government control. In 1900 a university for Control of the state stantinople was planned. Secondary education is given by the grammar schools, one of which exists in every

History.—The history of the Ottoman empire, at least so far as it touches the Balkan peninsula, is confessedly a barren record. It was by military conquests that the Ottomans secured a European foothold, and it was thus that the empire reached such splendid dimensions in the 16th century. But in time success disarmed them, and soldierly virtues decayed. Like the Median and Persian empires of old, the dominions of the Sublime Porte began to crumble away, so that there seems every like-lihood that the intruding Turk—for so he has always been regarded by

capital of a vilayet.

Western peoples—will on some future occasion be driven across the Boswhence porus to he cam. iprehenhe has shown himself incapable of coping with the with the huge task upon in the 15th century, he coping which, and when this was rejected he had body of soldiers was at his mothing else to offer. His highest merits, namely, his valour and religious fervour, have been the instruments of his undoing. For his inevitable and persistent appeal to the sword, whenever his will was questioned, created an insurmountable barrier to all friendly intercourse when they grew up were between himself and the governed the least sential products of the contract of the between himself and the conquered.

both the Greeks and Albanians are branch of Tartar invaders, who are severally as numerous as the Turks always known as the Seljukian Turks. These races compose captured Bagdad in 1058. This was a climax to many victorious campaigns and led directly to the foundation of imperial power by the Turks in Asia, a power which is still vigorous and effectual in our own times. Cairo and Jerusalem fell before the successors of Togrul Beg, and soon the Turks were in possession of Asia Minor and the greater part of Syria. But the Seljukians could not maintain the integrity of their speedily-won empire against the repeated assaults of the Crusaders and soon they pass into oblivion, their place being taken by the stronger and nearly-related tribe of Ottomans. These latter, who like the Seljukians took their name from a warrior chief (Othman), soon overran all the Asiatic provinces that had once been within the confines of the Roman empire, and by the middle of the 14th century had already made some headway in Europe. About 1353, when an emperor of the Palaiologoi dynasty was still weakly upholding the tottering fabric of the Byzantine empire. ing labric of the Byzantine empire, there was civil strife in the capital and one faction rashly called in the Tartars to their aid. The invitation was eagerly accepted, and like the Saxons of this country so the Ottomans made the appeal for aid a pretext for prosecuting their own conquests and for winning new territory for their own confor their own expansion. Hadrianople submitted to their sultan, Amurath I. (1360-89) in 1361 and soon the proud city of Constantinople and a few outlying and scattered dependencies were all that were left of the once mighty empire of Constantine. It was Amurath who remodelled the Janissaries and first used these troops which the three thoughtlessly embarked. He came Janissaries and first used these troops with a gift, the gift of Islamism, with such remarkable success. This and when this was rejected he had been the property of the success. The body of soldiers was at first composed by the success of the of Christian captives, and when their number was no longer sufficient to recruit the force the sultan proceeded to exact as a toll from the Christians every fifth male child. From this tributary band the best and bravest were trained for a soldier's career, and when they grew up were drafted into the Janissaries, which rank with the races, whilst the very excess of his Pretorians of Rome and the Giants of fanaticism compelled him to treat the Prussia as one of the finest and best-Christians, and indeed all save his disciplined bodies of infantry the world brother Mussulmans, as inferior beings has ever seen. To return to the days of who in refusing the Koran had laid Amurath: when he died he was sucthemselves open to every condemnation and contempt. In the 7th century 1403), who also proved a great contents of the Turanian stock, and victory at Nicopolis (in Bulgaria) over their story opens with the significant of their conversion to the Mohammedan faith. Little of consequence is told about them after this was crushed under the foot of until Togrul Beg, the leader of a the Mohammedan interlopers. The Christians, and indeed all save his disciplined bodies of infantry the world

throughout Western Constantinople seemed a doomed city. Indeed Bajazet had actually begun the siege of that coveted stronghold when the victories of the Mongolian chieftain, Tamerlane (Timour), forced him to cross the straits in haste to save his Asiatic dominions from this new aggressor. The issue was decided on the field of Angora (1402). Bajazet suffered an ignominious defeat and became the captive and sport of his insolent rival till death released him in 1405. But the advent of Tamerlane only de-ferred and could not stave off the downfall of Byzantium. In 1421 the Ottomans made an unsuccessful assault, and finally Mohammed II. encamped outside the city in 1453 with an army of 200,000. The resistance was weak, and the Turks were soon flooking as victors within the walls. Constantine XI., the last Byzantine emperor, died sword in hand, and the hoisting of the crescent of Islam upon the dome of St. Sophia was an ominous sign that the influence which had stood, however faintly, for Christianity and culture was no more. Greece was subjugated by the Ottomans between 1456 and 1460, just as Servia had been sub-jugated in 1389 after the battle of Kossova and Bulgaria by Bajazet in 1396, and just as Macedonia was annexed in 1430. Thus the Ottoman swallowed up the Eastern empire, but swanowed up the Eastern empire, but it was not yet swollen to its full glory. Mohammed, the victor of Constanti-nople, succeeded in penetrating with his standards into Italy, and for one year (1480) the city of Otranto (in Calabria) was under Ottoman sway. Selim the Inflexible (1512-20) over-ran the islands of the Archipelago, took possession of the whole of Syria (1515), obliged the Abbasside Caliph of Cairo to surrender his jurisdiction, and finally annexed Egypt after de-fecting the Mamelukes (1516). Pro-bably the empire attained its period of greatest splendour during the reign of Solyman the Magnificent (1520of Solyman the Augmneett (1936) 66). This warrior-king captured Bel-grade in 1521, and in the following year expelled the Knights of St. John from Rhodes, notwithstanding they made a gallant.nay, heroic, resistance. In 1526 he inflicted an overwhelming made a gallant nay, heroic, resistance. In 1526 he inflicted an overwhelming defeat on the Hungarians, whose lollowing Lewis II., died on the field of battle, and in 1529, after humiliating Vienna by a protracted blockade. he marched with a human later than the later of Vienna. This time the capital was rescued by the opportune arrival of Solieski, king of Poland, and the Duke of Lorraine. The bulk of Lorraine are the vientians cast in Leopold and Leopold and Marched with a human later of Vienna were once more at capital was rescued by the opportune arrival of Solieski, king of Poland, and the Duke of Lorraine. This time the capital was rescued by the opportune arrival of Solieski, king of Poland, and the Duke of Lorraine. The capital was rescued by the opportune arrival of Solieski, king of Poland, and the Duke of Lorraine. The capital was rescued by the opportune arrival of Solieski, king of Poland, and the Duke of Lorraine. The capital was rescued by the opportune arrival of Solieski, king of Poland, and the Duke of Lorraine. The capital was rescued by the opportune arrival of Solieski, king of Poland, and the Duke of Lorraine. The capital was rescued by the opportune arrival of Solieski, king of Poland, and the Duke of Lorraine. The capital was rescued by the opportune arrival of Solieski, king of Poland, and the Duke of Lorraine. Vienna by a protracted blockade, he marched with a huge army against Germany. That country was then in the throes of religious dissensions, and which concluded this war (1699), continuous to the Venetians, and the call of patriotism which induced Catholics and Protestants to Austrians. Herzegovina was ceded

victory roused the gravest alarms unite, and so provided Charles with Europe and a formidable army, before which Solyman prudently retired. Still for the time being a great part of Han-gary became Turkish domain, and at Buda a Turkish ' Pasha ' was actually installed. Further, the authority of the sultan was almost supreme in the Mediterranean, and it was under his protection that the pirates of Algiers terrorised merchants and sailors and kidnapped Christians to sell them into bondage. Charles' brilliant seizure of Tunis (1535) was a scrious check to Ottoman influence in the S. After the death of Solyman, who was the last of the great soldier-sultans to leave the empire greater than he found it, there were only two fresh acquisitions of importance, namely, Cyprus, which was wrested from Venice in 1571, and Crete, which finally passed into Turkish hands in 1669 after Candia, the capital, had withstood a slege for over twenty years. From the last quarter of the 16th century dates the gradual but steady decline of the sultan's supremacy. Already, however. the commonwealth Venice on the Adriatic and northward the kingdoms of Hungary and Poland had proved redoubtable buffers between Christendom in the W. and the lands of Islam in the E. As early as 1456 John Huniades of Poland had repulsed the Turks from Belgrade, but the first serious disaster which overtook them was the anni-hilation of their flect in the Gulf of Lepanto (1571) by the combined squadrons of Philip II. of Spain and the Venetians. This victory put an abrupt stop to Ottoman encronch-ments in the ments in the that it was dec

> recian Most of the Turkish wars continued to be waged with Hungary and Venice. The Emperor Leopold of Austria in-curred the hatred of his Protestant subjects in the former kingdom by his persecutions, with the result that they appealed to the Porto for aid. The latter readily compiled, and in 1683 the Turks were once more at the gates of Vienna. This time the

> > of Carlowitz,

regard Russia as their champion and to revive the Eastern Church, which had so long lain almost lifeless at the foot of its Mohammedan supplanter. The long series of Russo-Turkish wars began in 1730. By the Peace of Kainardji (1774) the sultan relin-quished his suzerainty over the Tartar Khans of the Crimea and Russia secured the approach to the Black Sea for which she had so long been scheming. The Treaty of Jassy (1792), which closed a second war, was Pruth. Twenty one years later Nicholas I. of Russia declared a Pruth. fourth war on his now inveterate foe. Already his forces had crossed the Balkans and reached Adrianople, and would in all likelihood have closed in on Constantinople had not England and Austria adopted the rôle of peacemaker and emphatically forbidden. Nicholas' further march southward. This campaign was concluded by the

1

by Leopold to T. A second struggle the Turkish empire, and in so doing between the House of Hapsburg and the Porte was terminated by the Peace of Passarowitz (1718), when blunted the edge of Nicholas' inthe former received Belgrade and tention to pose as champion of his part of Bosnia and Wallachia. T. had won back the Peloponnesus in 1716, ifrman, whereby he himself guaranand Belgrade was recovered in 1739, teed to them the free exercise of their By this time a new and more danger, religion. Moreover, England and by this time a new and more dangerreligion. Moreover, England and
ous enemy, namely Russia, had arisen
and was pressing hard upon the northcastern frontiers of the empire. At
first the latter more than held her
own, but when the energetic Catherine
own, but when the energetic Catherine
the sultan's empire was for the
moment maintained, and the Christhe Slavs of Russia and the kindred the Slavs of Russia and the kindred peoples of Bulgaria and Servia, whilst Catherine and her successors taught the Christian subjects of the Porte to bouse, and the fate of the 'sick man' house, and the late of the sick man (Turkey) was designedly left a moot question. The whole 19th century is blackened for T. by interminable revolts. In 1798 Napoleon easily overcame the Mamelukes of Egypt, who were nominal vassals of T., but it was not till 1879, the year of the establishment of the dual control of France and England, that Turkish overlordship in that province finally came to an end. The broad movements for independence in Italy and Germany no doubt infected the Balkan states with the same longing for a which closed a second war, was bermany no doubt infected the Bal-equally favourable to Catherine, for the northern boundary of the Ottoman empire was pushed back to the Dniester. In 1807, the year of the Treaty of Bucharest, this boundary was put still farther S., as far as the Printh. Twenty one years later harbarties were practiced in Bulgeria. barbarities were practised in Bulgaria parbanties were practised in Bulgaria during the rising of Herzegovina, Bosnia, and the other Balkan states (1876), whilst Europe is still aghast at the atrocities perpetrated against the Armenians in 1895. When the latter seized the Ottoman bank in Constantinople (1896), this act of violence was made the pretext of a supervised extracted of the contraction and contractions are contracted as a contraction of the contraction and contractions are contracted as a contraction of the renewed outbreak of fanaticism and cruelty, and in Pera, Trebizond, Gurun, and Diarbekrete the unfortunate people were the victims of wholesale slaughter. In 1877 Russia once more adopted the leadership of Peace of Adrianople (1830), the chief provision of which was the recognition by the Porte of the complete independence of Greece. Nicholas, indeed, had carefully timed his a Pan-Slavonic movement, and came invasion so as to reap full harvest forward as the defender of the unity of the culture. of the sultan's embarrassment con- happy Christians. Once more foreign of the suitan's embarrassment con- happy Christians. Once more foreign sequent on the Grecian insurrection, interference alone stayed the Russian For the Greeks, eager to become a advance on the capital, and the short nation as of old, had risen in revolt. campaign was brought to an end by But though they made a plucky restauce, they would assuredly have succumbed to their barbarous opportunity which was drawn up by the Great succumbed to their barbarous opportunity actions and Monte-England, France, and Russia—come garia, Servia, Roumania, and Monte-to their assistance and ranguished never was formally actional day. to their assistance and vanquished negro was formally acknowledged, the Ottoman fleet at the memorable Bosnia and Herzegovina were occubattle of Navarino (1827). The pied by Austria, and Cyprus handed Crimean war of 1853-56 grew out of over to British control. Eastern Czar Nicholas' ambition to parcel out. Roumelia, whilst being retained by

the sultan, was given an 'adminis- law being proclaimed in Constant-trative autonomy 'under a Christian nople. In 1908 Bosnia and Here-Servia, it should be noted, had been more or less free since 1807 when Kara or Black George won fame as her deliverer, and the sturdy inhabitants of the mountain fastnesses of Montenegro had been virtually free from the Ottoman voke since 1696. Moldavia with Jassy, and Wallachia, with Bucharest as its capital, had coalesced into the single kingdom of Roumania in 1861. Cyprus demanded union with Greece as early Cyprus as 1895, and in 1908 Crete, which was evacuated by Turkish troops in 1898. declared its affiliation with the same

state. There remains only to refer to the feeble and, as it now appears, too tardy movement of the Turks towards reform and the adoption of Western government and practice. As long ago as 1839 a body of progressive measures, entitled the Hattischerit was promulested and Chris-Sherif,' was promulgated, and Christians were at last admitted to office in 1849. Riots in the capital and the miserable condition of tumultuous unrest which prevailed in all the European provinces extorted from the sultan another and enlightened political constitution in 1876, and Midhat Pasha (d. 1884) devoted a strenuous life to the furtherance of liberal ideas and progress. But the new constitution never took effect, and remained nothing more than a piece of parchment until the Liberal pace of parenment until the Liberal party rose in a body twenty years later (1896) and demanded its so-called restoration. In April 1897 war broke out between T. and Greece, but in a few months the latter were worsted, and only saved by the interference of the great powers, which led to peace being signed at Constantinonle in December of the Constantinople in December of the same year. Later, the growing abuses same year. Later, the growing abuses of the government resulted in the formation of what is known as the 'Young Turk 'party, which included in its ranks some of the most influential men in T., who urged the crying need of reform. The movement was, however, partly suppressed in 1901. Seven years later the 'Young Turks' again agitated for the attainment of their ends. this time with Turks' again agitated for the attainment of their ends, this time with more effect, as the sultan opened a new parliament, with Ahmed Riza, one of the leaders of the movement, as president. In 1909 the sultan was deposed, and his brother was called to the throne as Mohammed V. There had previously been trouble with France over the hinterland of Tripoli and with Bulgaria in regard to the liberation' of Macedonia. riots and

govina were annexed by Austria, and in 1909 Bulgaria's claim to independence was accepted. In 1911 Haly forcibly seized Tripoli, and after a year's desultory fighting T. was obliged to sue for peace, as fresh trouble was brewing nearer home (see BALEAN WAR). The first Turkish parliament was dissolved in 1912, and a fresh cabinet was created the same year. The treaty of London was signed on May 30, 1913, which left T. with only a small strip of territory in Europe, extending from Midia on the Black Sea to a point near Central Ibrige on the Ægean. Owing, however, to quarrels between the allies, negotiations concerning which are still pending, Bulgaria may have to give back part of her conquered terri-tory, and thus T. may receive twice as much territory as she had left her

under the treaty of London.

Literature.—Like the early Latin
poetry, the literature of the Osmanlis is almost wholly one of imitation, and just as Terence and Plautus sought inspiration from the old Greek writers of comedy, so the primitive Ottoman poets drank most deeply from the well of Persian verse. From Persian poets they borrowed their forms. poets they borrowed their forms, their style, and their theme. Ahmed Pasha (d. 1496), a vizier of Mohammed II., freely plagiarised the popular ghazels of the Persian Nevayi (d. 1500). Fuzuli of Bagdad (d. 1555), one of the first of Ottoman poets, is admired above all for the tender beauty of his Divān or collection of the reason and it was this rebicle the ghazels, and it was this vehicle (the ghazel) which the versatile Nabi (d. 1712) chose when he wished to reproduce the didactic and philosophical strain of the Persian Saib (d. 1677). The brilliant panegyrics of Net'i of Erzerum (d. 1634), whose light in the history of Turkish poetry shines as brightly as that of Fuzuli, are expressed in the form of the 'kasida' or train of Arabia. Both the great and lyric of Arabia. Both the ghazel and lit WAS

of the first couplet reappears in each alternate line. The Khusrev and Shirin of Sheyki of Kermiyan (d. c. 1440) was a romance in verse, dealing with an old Persian story and written like the elaborate and prolix Iranian deposed, and his prother was caused to the throne as Mohammed V. There had previously been trouble with France over the hinterland of Tripoli and with Bulgaria in regard to the 'liberation' of Macedonia, riots and bloodshed occurring in various parts of the country, which ended in martial and tainted with that artificiality which invariably infects a court Miller, The Ottoman Empire (1801-literature. Far-fetched conceits, 1913), 1913. Literature: E. J. W. extravagant word-painting, and a Gibb, History of Ottoman Poetry (5 stereotyped phraseology continually obscure what are often fine thoughts.

Turkey (Meleagris), the name for

The same faults are apparent in the prose history of Sa'd-ud-din (d. 1599), entitled the Crown of Chronicles (Tāj-ut-Tevārīkh), where the excess of rhetoric palls and where that favourite embellishment known as the 'sej,' which consists in rhyming the last words of successive clauses, produces a jingle which falls unpleasantly on Western ears. Fin-ally, the imitation of Persian models is equally apparent in subject-matter. Ottoman poets, like their masters, never sang the song of battle, though they belonged to a race pre-eminently. war-like, but devoted themselves rather to the composition of countless love-lyrics and odes to spring, as well as to the other joys of nature. There is a light-hearted spontaneity in the ghazels and kasidas of Nedim (d. 1730), which lifts him on to a plane of conspicuous originality, though his elegant diction and grace are clearly Iranian in origin, but the Husnushk (Beauty and Love) of Sheykh Ghälib (d. 1798), though it is justly esteemed as one of the finest allegories in the learners. in the language, bears every trace of the contemporary revival of Persian domination. Space allows only of the mention of two other writers, and they are Shinasi Efendi (d. 1871) and Hamid Bey, a leading representative of the infant school of playwrights. In the last century a revolution was effected in literature as in the politi-cal world. Western and especially French modes of thought filtered into the capital, and the new school of writers have gone back to a sim-plicity and naturalness of style more suited to their modern outlook.

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Turkey (Meleagris), the name for two American species, the largest of the game birds. M. gallipavo, the origin of the domesticated varieties, formerly occurred throughout the N. formerly occurred throughout the N. American continent, and was abundant in the United States, in parts of which it is still hunted with greyhounds. The wild birds are both larger and more ornate than domesticated Ts., which, however, have been much improved by introductions of wild blood from time to time in years. wild blood from time to time in recent years. The largest of the domesticated varieties is the American mammoth bronze, the plumage of which is a beautiful dark bronze with a red metallic lustre. Among other varieties are the white, buff, slate or lavender, and black. M. occellata, the other species, occurs in Honduras, and possesses plumage of great brilliancy with ocellated or eyed tail feathers.

Turkey-buzzard, see VULTURE.
Turkey-red, see DYEING—Alizarin
colouring matters.

Turkistan, see TURKESTAN.

Turkmanshai, a tn. of Azerbaijan, Persia, 65 m. S.E. of Tabriz. II was the scene of a treaty in 1828 ceding a large part of Armenia to Russia.

Turkomans, or Turkmenians, a branch of the Turki race, inhabiting W. Turkestan and N. Persia. They are chiefly nomad shepherds and are all Mohammedans, mainly of the Sunnite sect. They appear to be an offshoot of the Uzbegs, who reached the Caspian in the 14th century, and several dynasties in Asia Minor, Persia, Syria, and Egypt sprang from them. See Baker, Clouds in the East. 1886; Vambery, Travels in Central 1886; Var Asia, 1863.

Turk's Islands, see Caïcos, Cayos, or The Keys.

Turmeric (Curcuma longa), a plant with long leaves and a spike of pale cream flowers, a native of Ceylon, and extensively cultivated in India for its rhizomes, which when dried and ground yield a yellow dye. It is also used as an ingredient in curries, and has various uses in Hindu medicine. T. paper is an unsized paper dipped in an alcoholic solution of T., and is used as a test for alkalies.

Turnberry Castle, a ruin on the W. coast of Ayrshire, Scotland, on the Firth of Clyde, said to be the birthplace of Robert Bruce.

Turnbull's Blue, a blue pigment, ferrous ferricyanide, which is preci-

Mass.), 1907; Sir E. Pears, Turkey pitated by the action of potassium and its People (London), 1911; W. ferricyanide on a ferrous salt. Its

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Turnebus, (1512-65), Adrien French classical scholar, born at Les Andelys, Normandy. He studied at Paris, and in 1547 became professor of Greek and Latin there. He enjoyed a great reputation, Montaigne being amongst his friends and con-temporaries. He wrote theological temporaries. He wrote theological and critical treatises, and translated the Greek and Latin authors. See In Turnebi, Obitum Nænia (1651), by Passeray.

Turner, Charles Tennyson,

TENNYSON, CHARLES. Turner, Joseph Mallord William (1775-1851), a landscape painter. The son of a barber, he was born in London, and in 1789 he entered the Royal Academy School, where he became intimate with Girtin. In 1798 T. exhibited several pictures at the Royal Academy, and four years later he was made an academician; while in 1807 he began the publication of his Liber Studiorum, this consisting of elf.

ther In nd Italy, while in 1831 he visited Scot-land, having been asked to illustrate a new edition of Sir Walter Scott's poems. The following year he lived at Venice, while in 1836 he went a second time to France; but the closing years of his life were spent mainly in London, and he died there. He was buried in the crypt of St. Paul's Cathedral, and, in accordance with his will, the National Gallery acquired a large array of his oil-paintings and over a thousand of his sketches. The Municipal Museum, Glasgow, also contains a number of his works, while there is a fine collec-tion of his water colours in the National Gallery of Scotland. T. possessed pre-eminently the gift of cap-turing and rendering transitory effects of light, and his triumph herein of light, and his triumph meters proved a vast inspiration to the Barbiron school, and afterwards to the impressionists. The most important study of his art is that embodied in Ruskin's Modern Painters, but the reader should likewise consult. The

reader should likewise consult The Exhibited Works of Turner, by C. F. Bell, and The Engraved Work of Turner, by W. G. Rawlinson (1913).
Turner, Sharon (1768-1847), an Anglo-Saxon historian, born in London. Wrote History of England from the Earliest Period to the Death of Elizabeth and The Sacred History of the World, and carried on valuable researches among original Icelandic and searches among original Icelandic and Anglo-Saxon MSS.

Turner, Sir William (b. 1832), an English surgeon, born at Lancaster. He is the editor of the Journal of Pop. 18,628.

composition is represented by the Anatomy and Physiology, and his formula 3Fe(CN), 2Fe(CN). published numerous papers on human and comparative anatomy.

Turning, the process of cutting and shaping wood, metal, and other material by causing it to be rotated in a lathe, while a tool is held against it. The tool is rigidly fixed for the time being with its shaft at right angles to the surface of the material. Tools are made with faces at various angles to suit different kinds of material and to produce different modes of cutting

effect. Turnip, or Brassica rapa, a blennial cruciferous plant grown for its thick fleshy root both as a garden and as a farm crop. Ts. are classified according to their shapes, Long, Tankard or Spindle, Round or Globe, and Flat. Another classification is according to colour of the flesh. fleshed varieties are of rapid growth and produce much bulk in a short time, but their feeding value is low and they are liable to be injured by frost. The yellow-fleshed varieties are of slower growth, but are of supe-rior feeding value and keep better during winter. They are probably hybrids between the T. and the Swede (Brassica rutabaga) which is most obviously distinguished by its neck or collar.

Turnpike Roads, see Tolls.

Turnsole, a name for various heliotropic plants, including the genera

Heliotropum and Helianthus.
Turnstone, or Strepsilas interpres.
a shore bird allied to the ployers and so called from its habit of turning over stones and shells on the seashore in the search for marine insects and small crustacea. It is widely distributed, but breeds chiefly on Scandinavian coasts, and only visits Britain in the winter. It is about 9 in. long. The upper parts are chest-9 in. long. The upper parts are chest-nut with black spots, and the lower parts white, except on the breast.

Turnu-Magurele, the cap. of the dept. of Teleorman, Roumania. Is a river-port and trades in grain. 8700.

Turnus, the son of Daunus and Venilia, and King of the Rutulians when Aneas reached Italy. He was stirred up by Hera's commands to oppose Encas, and appears in Virgil's Encid as a brave warrier. He was Encid as a brave warrior. He was slain by Encas. Livy and Dionysius also mention him.

Turnu-Severin, the cap. of the dept. of Mehedintzi, Roumania, on the l. b. of the Danube. The old town, named from the tower forming the head of Trajan's bridge, was destroyed in the 15th century, and the present one was founded 1835-41. Trades in live stock, cereals, and petroleum.

the stems of pine trees or Conifera and collecting the sap which flows out. consists of a solution of resins in a liquid called 'oil of T.' Distillation in steam causes the essential oil to pass over, a residue of 'colophony' (violin resin) being left behind. Oil of T. is a colourless liquid (sp. gr. '86, boiling point 158-160° C.) which is not constant in composition or physical properties, but varies according to the species of pine from which it is obtained. It is insoluble in water, but is an excellent solvent for phosphorus, sulphur, iodine, and resins, and is, therefore, used in the preparation of paints and varnishes. oil is used in medicine externally as a counter-irritant.

Turpin, Archbishop of Rheims, friend and companion of Charlemagne-such are the names and qualifications assumed by the author of a chronicle in Latin prose, narrating the expedition of the Frankish emperor against the Saracens of Spain. It seems to have sprung out of the epic ballads and traditions of the Carlovingian heroes, through the legendary manner in which they are told there is visible a monkish aim—viz., to encourage the foundation of churches and and monasteries, the undertaking of religious wars against the Saracens, and, above all, the pilgrimage to San Jago de Compostella. The chronicle has been printed in Reuberus's edition of the Scriptores, but see more particularly Ciampi, De Vita Caroli Magni et Rolandi Historia, J. Turpino vulgo tributa.

Turpin, Richard (Dick) (birth variously stated at 1706 and 1711, hanged 1739), a brutal highway robber whose daring exploits on his mare 'Black Bess' have secured for him in the eyes of posterity an almost purely legendary renown (see Harrison Ainsworth's romance of Rookwood). was the son of an Essex innkeeper, and began his predatory career by cattle-stealing when apprenticed to a butcher (see Wheatley, London, Past and Present). Ultimately tried and convicted at York for horsestealing and hanged.

Turquoise, or Callaite (Al₂O₃.P₂O₅+ 5H2O), is a blue or bluish green mineral which is in great favour as a gem. It is reniform or stalactitic, never crystallised, has a waxy lustre, and is feebly translucent or opaque. (Hardness 6, sp. gr. 27.) On placing in hydrochloric acid the blue colour disappears. The best specimens for gems are obtained in Persia, other good locali-ties being India, Tibet, Arabia, and Saxony. See also STONES, PRECIOUS.

Turr, Stephen (1825-1908), a Hun- a late form of the Doric.

Turpentine is obtained by cutting garian general, born at Baja. He estems of pine trees or Conifera and joined the Italian forces and fought several times against the Austrians. He took part in the expeditions of Garibaldi, and afterwards was appointed general and governor of On his return to Hungary Naples. he became engaged in public works, and in 1881 commenced the boring

of the Isthmus of Corinth.
Turret (Lat. turris, a tower) is used as the diminutive of tower, but the diminutive is used not absolutely, but in comparison with the size of the main structure. Ts. are frequently attached to one or more of the angles of a tower, and contain a

winding stair leading to the roof.
Turretin, Francis (1623-87), born at Geneva, studied with great distinction under Spanheim, Morus, and Diodati; and was ordained pastor at Geneva in 1647. Having removed, in 1650, to fill the pastorate of Leyden, T., in 1653, was invited to Geneva to be professor of theology. His celebrated InstitutioTheologiæ Elencticæ made his name known in regions far removed from Geneva. The whole Opera of T. were published at Geneva in four volumes the year after his death.

Tursellinus, Horatius, or Orazio Torsellino (1545-99), an Italian Jesuit, rector of the Jesuit seminary at Rome (1579). He wrote De Vita S. Francisci Xaverii (1594), De Usu Particularum Latini Sermonis (see Hand's ed. 1829), and Epitome Historiarum a Mundo Condito ad Annum 1598 (in Italian). See Bibl. Brit.; Moréri, Grand Dict. Hist.

Turile, see TORTOISE.
Turile Dove, or Turiur communis, a summer visitor to Britain, which it leaves about Michaelmas to winter in Africa. It is from 12-13 in. long, with a long, much-rounded tail. The plumage is greyish brown with yellow on the sides of the head and pink on the neck and breast. The back of the neck and crown are greyish blue, and the legs and toes are red. pure white eggs are laid in a rough structure of twigs placed in a tree near the ground. The male assists the female in incubation, and their devotion is proverbial. Another species is the collared T. (T. risorius), which is the dove most commonly kept in captivity.

Tuscaloosa, a city of T. co., Alabama, U.S.A., 55 m. S.W. of Birmingham, on the l. b. of the Black Warrior R. It is the seat of Alabama University. Has cotton manufactories and lumber-mills. Pop. (1910) 8407 (1910) 8407.

Tuscan Order, in architecture, one of the five Roman orders recognised by the Renaissance writers. It was

Tuscany (It. Toscana, ancient Etruria), a region comprising the S.W. ancient of the N. half of Italy, bordering on the Mediterranean, bounded N. by Emilia, E. by Umbria and the Marches, S. by Rome, W. by Liguria. Most of the country is hilly, containing that part of the Apennines known as the Apuan Alps. The marshy Maremma (850 sq. m.) in the S. was drained by Leopold II. early in the 19th century, and now affords pasture to horses and cattle. The Arno is the chief river, united to the Tiber (E.) by the Chiano Canal. There are eight provinces, the total area being 9304 sq. m. Florence, Leghorn, Pisa, and Pistoja are the chief industrial centres. Chianti and Montepulciano wines, oil, grain, flowers, and silk are produced. There is much mineral wealth, and hot springs abound. The Tuscan language became the literary language of Italy. Under the Medici Florence was of supreme importance in T. A grandduchy of T. was formed (1569); from 1737 it was under the House of Hapsburg-Lorraine, and became part of Italy (1861). Pop. 2,694,706. See Repetti, Dizionario Geog. della Toscana, 1834-46; Zobi, Storia Civile della 10scana, 1852, 2001, Storia Civile della Toscana, 1850; Von Reumont, Gesch. Toscanas, 1876-77; Robiony, Gli Ultimi dei Medici, 1905; J. Ross, Old Florence and Modern Tuscany; and D. N. Lee, Scenes and Shrines in Tuscany.

Tuscaroras, a tribe of N. American Indians, driven out of N. Carolina in 1715 by the settlers, and of Iroquoian In the War of American Indestock. pendence they divided, some fighting others against, the English. The remnant of them, numbering about 700, is now divided reservations in Canada and Ne

Tusculum, an ancient tn. of 12 m. S.E. of Rome, said to have been founded by Telegonus, son of Odys-seus. The modern Frascati is close to the site. From the battle of Lake Regillus (497 B.C.) till the Latin War of 340 B.c. it remained faithful to Rome. It was settled again 335 B.c., and from that time followed the fortunes of Rome.

Tuskar Rock, situated off co. Wexford, Ireland, 7 m. N.E. of Carnsore Point, and has a lighthouse.

Madame Marie (1760 -Tussaud, 1850), foundress and proprietress of the wax-work exhibition in London, born at Bern, Switzerland. Studied art under her uncle in Paris, and was arpointed drawing-mistress to the ill-fated family of Louis XVI. Came to England in 1802 and settled in London, where her exhibition became, and still is, one of the most popular sights of the city.

Tusser, Thomas (c. 1521-80), an English poet and writer on agriculture, educated at Eton and Cambridge. He served Lord Paget as a musician for ten years, dedicating to him his Five Hundreth Pountes of Good Husbandric united to as many

Good Husbandric united to as many of Good Husbifery, 1573. An autobiography in verse is prefixed. See Payne and Herrtage's reprints (1878). Tussilago, a genus of composite plants. T. farfaria is the coltsfoot, a common plant, the yellow flower-heads of which go to seed before the large downs leaves appear.

large downy leaves appear.

Tussock Grass, or Dactulis caspitosa, a tall-growing grass, native of the shores and sand dunes of the Falkland Isles. It has been introduced into Britain, and in a few places is cultivated as a fodder for cattle. name is also given to the tufted hair grass (Aira cæspitosa).

Tussock Moths (Dasuchira), a genus of moths, two species of which occur in Britain, the rare dark T. M. (D. fascelina) and the pale T. M. (D. pudibunda), a common moth of a greyish colour. Its caterpillar, which has a number of tufts or tussocks of hair, sometimes causes considerable damage to hops and forest trees.

Tuticorin, a scaport tm., Tinnevelli dist., Madras, British India, 443 m. from Madras, on the Gulf of Manaar. The chief industry is cotton-spinning. Pop. 28,500.

Tutilo, or Tuotilo, a learned Swiss monk of the 9th century, of St. Gall's convent, Switzerland, noted as a gold painter. sculptor, worker. musician, and an eloquent preacher. He died about 896 A.D. Sec Nagler's Künstler-Lexicon.

Tutor, in Scots law, the guardian

of the person the estate of under four-

teen and a female child under twelve. Ts. are either: (1) nominate, i.e., he who is named by the father or mother in a will or other document; (2) of law, i.e., he who succeeds by more operation of law in the absence of nominate 7s. (seldom resorted to); or (3) define to he who experies to the self-law to the whole self-law to the w

(3) dative, i.e., he who applies where no T.-of-law demands the office.
Tuttingen, a tn. in Würtemberg, Germany, 38 m. S.S.W. of Reutlingen, on the R. Danube. Chief manufs. shoes, leather goods, and cutlery.

shoes, leath Pop. 15,862.

Tutuila, an island of the Samoan archipelago, in the Pacific Ocean, 40 m. S.E. of Upolu, and belonging to the U.S.A. Chief export, copra. Pop. 4800.

Tuxpan, a port in the state of Vera Cruz, Mexico, 5 m. from the Gulf of Mexico, and 148 m. N.W. of Vera Cruz. Pop. 16,440.

are tanning and indigo. Pop. 10,239.
Tvachtri, or Tvashtri, in the Rigyeda, the Hephæstus or Vulcan of mythology, who shaped

heaven and earth and forged the golden thunderbolts of Indra.

Tver: 1. A gov. of Central European Russia, between Novgorod and Russia, between Novgorod and Moscow govs. It is on the S. slope of the Valdai Hills and watered (N.W.) by the Upper Volga, the W. Dwina, and the Msta. There is extensive forest-land in the N. Area 24,975 sq. m. Pop. 2,213,800. 2. The cap. of above, at the junction of the Tvertsa and the Volga, about 100 m. from Moscow. There is a 17th-century cathedral and an imperial palace built by Catharine II. Cotton and leather goods are the chief panace built by Catharme II. Cotton and leather goods are the chief manufs. Boots and shoes, hosiery, sail-cloth, cordage, pails, and earthen-ware are produced. T. is an im-portant river-port and the seat of a Greek archbishop. Pop. 59,083.

Twain, Mark, see CLEMENS, SAMUEL

LANGHORNE.

Tweddell, John (1769-99), a famous English scholar, born near Hexham. Unfortunately, most of his MSS. were lost, and all that remains of his work is a selection of his private letters and his Prolusiones Juveniles.

Tweed, a woollen fabric, manufactured in Scotland and Ireland (Harris and Donegal T.) and extensively worn. The name seems to be a corruption of 'tweel,' or 'twill,' used for materials which have parallel diagonal lines over the surface of the

cloth.

Tweed, a river in the S. of Scotland. and draining most of the E. portion of the Scottish lowlands. It rises in the S.W. of Peeblesshire and flows in a north-easterly direction, between Berwickshire on the N. and North-umberland on the S., where it enters the North Sea. It has a total length of 97 m., and drains an area of 1870 of 9. m. It is one of the best salmon streams in Scotland, but the fisheries are less important now than they were formerly. The traffic on its waters is chiefly confined to Berwick, and it is navigable only in its last 6 m.

Tweed, ' Boss,' see TAMMANY HALL

AND SOCIETY.

Tweeddale, originally the name of

Peeblesshire, Scotland.

Tweedmouth, a seaport of Northumberland, England, and a suburb of Berwick-upon-Tweed. It manufs. Berwick-upon-tweed. It manus, warp is raised one thread and demachinery and is engaged in salmon-pressed two or more threads for the fishing. Pop. (1911) 3500.

Tweedmouth, Edward Marjori-Twillingate, a seaport tn., cap. of banks, Baron (1849-1909), an English the Twillingate and Fogo dist., New-

Tuxtla, the cap. of the state of statesman, born in London and edu-Chiapas, Mexico, 40 m. W. by S. of cated at Oxford. He became a bar-San Cristobal. The chief industries rister in 1874, and from 1880-94 represented Berwick in the House of Commons in the Liberal interest. In the latter year he succeeded to the peerage and was made Lord Privy Seal and Chancellor of the Duchy of Lancaster. In 1905 he was made First Lord of the Admiralty.

Twelfth-Day, the festival of the Epiphany, in commemoration of the visit of the three kings or magi to the infant Jesus, kept on the twelfth day after Christmas, Jan. 6. ceremonies used to be connected with

Twelfth Night.

Twelve Patriarchs, Testaments of the, a series of writings purporting to care, a series of writings purporting to give the dying speeches of the twelve sons of Jacob. Each speech develops into an exhortation to avoid some particular sin or practise some special virtue. It is a Jewish work of the 2nd century B.C., but early under-went Christian interpolation. It is referred to by Tertullian and Origen. See article in Jewish Cyclopædia.

Tables, Duodecim Twelve or Tabulæ, the earliest code of Roman laws, drawn up partly from existing laws, partly as new legislation by the decenvirs (451-449 B.c.). See Livy, iii. 31-37; Cic., De Leg. ii.; Rep. ii. 37, 63; Galus, Dig. x. 1; Xlvii. 22, ctc.; Schoell's Legis Duodecim Tabularum

Reliquiæ, 1866.

Twickenham, a par. and tn. of Middlesex, England, on the l. b. of the Thames, opposite Richmond. Many eminent men lived here, including Pope, Sir Godfrey Kneller, and Horace Walpole. Pop. (1911)

29,374. Twilight. The diffused daylight which precedes and follows the passage of the sun above and below the horizon respectively is due to refraction, reflection, and dispersion of the light of the sun by the atmosphere, chiefly by means of the dust and water particles contained. Its brightness varies with these conditions, but mostly with the distance of the sun below the horizon; when this exceeds 18° twilight ceases. 18° twilight ceases. Beyond the Arctic and Antarctic circles T. increases according to season, extending over many weeks in the spring and Owing to the increasing angle at which the sun approaches the horizon towards low latitudes, the duration of T. decreases; it decreases also with altitude. At Quito it is no more than twenty minutes.

Twill, a woven fabric in which the warp is raised one thread and de-pressed two or more threads for the

foundland, 160 m. N.N.W. of St. which year he was appointed to the John's. Pop. about 4000.

English div'-

He translatnotes and

assisted Burney in his Hist. of Music. Selections from his Correspondence were published as Recreations and Studies of a Country Clergyman, 1883. See Sandy's Hist. of Classical Scholar-

Twinkling, see Scintillation.
Twiss, Sir Travers (1809-97); an
English jurist and writer, professor of political economy at Oxford (c. 1842-47), and of civil law (1855-70). He was queen's advocate-general and Mas queens autocate schelar and knighted (1867), resigning all public offices (1872). His works include: The Law of Nations, 1861-63; Monumenta Juridicia, 1871-76; Belligerent Right on the High Seas, 1884.

Tyburn, the name formerly applied to the Middlesex gallows, which stood at the W. end of Oxford Street. The last execution took place there in 1783.

Tyche, see Fortuna.
Tycho, see Brahe, Tycho.
Tyldesley, an urban dist. of Lancashire, England, 10 m. N.W. of Manchester. The chief industry is cotton spinning. Pop. (1911) 15,582.
Tyler, a city in Texas, U.S.A., 100 m. E. by S. of Dallas. Has various manufe, and is eithered in a

various manufs., and is situated in a prosperous agricultural region. Pop.

(1910) 10,400.

Tyler, John (1790-1862), tenth president of the United States, born in Charles City, Virginia. He was called to the bar in 1809, and in 1811 he was elected a member of the Virginia elected a member of the Virginia House of Delegates. From 1816-21 he was a member of the national House of Representatives, and in 1825-27 governor of Virginia, becoming a senator in 1827, when he showed his hostility to a high tariff policy. In 1840 he was elected vice-president, succeeding Harrison the next year as president, in which capacity he stood as it were midway between the two great parties, without the support of either, for though he frequently showed himself in sympathy with the Whigs he was never wholly one of their number; the Whigs themselves refused to acknowledge him as a member of their party. Besides the Ashburton Treaty, the most important act of his administration was the annexation of Texas in 1845. His last years were devoted to the Confederate cause.
Tyler, Moses Coit (1835-1900), an

at Griswold, Connecticut. He was favour, but having published The professor of English literature in the University of Michigan, 1867-31, in the king's good-will, and steps were

chair of American history in Comell offines. Pop. about 4000.

Twining, Thomas (1735-1804), an University, a position he held till his nglish diversity a position he held till his nglish diversity of Literature during the present the

Tyler, Wat (d. 1381), an English rebel, was the leader in the rebellion of 1381. He led his followers, the men of Kent, on the road to London, releasing John Ball from prison at Maidstone. He then proceeded to Blackheath and burnt the prison at Southwark and plundered the archbishop's palace at Lambeth. Being met by Richard he demanded im-mediate redress of grievances, and while preparations were being made to effect this T. entered the Tower and murdered Archbishop Sudbury and Sir Robert Hales. He was however, killed by the mayor, Sir William Walworth, the following day.

Tylor, Sir Edward Burnett (b. 1832), an English anthropologist, born in London. He travelled in America in 1855, and the following year visited Mexico, where he became interested in the prehistoric remains, and took up the study of the science. He recorded his observations in Anahuac; or Mexico and the Mexicans, the interest and Maddry. 1861. which Ancient and Modern, 1861; which

brane between the external and the internal ear, sometimes called the drum of the car.

Tynan, Katharine, alias Katharine Tynan Hinkson (b. 1861), was born in Dublin, and educated at a Drogheda convent. Sho began writing at the age of seventeen, and has published both novels and verse. Her reminiscences are about to be published (1913) by Messrs. Smith, Elder & Co., under the title Twentyfive Tears.

Tyndale, William (c. 1490-1536), a translator of the Bible, was a native of Gloucestershire. In 1521 he be-came chaplain and tutor in a household at Old Sodbury in Gloucestershire, but his sympathy with the new learning aroused suspicion and he removed to London; but finding it impossible to complete his translation of the N.T. in that city, he went to Hamburg and ultimately to Cologne, where in 1525 he began printing. In 1528 he published Parable of the Wicked Mammon and Tyler, Moses Coit (1835-1900), an the Obedience of a Christian Man, American historian and scholar, born and was for a time in Henry VIII.'s

taken for his imprisonment. He was arrested for heresy, imprisoned, strangled, and burnt. His fame rests upon his translation of the Bible, imprisoned, consisting of N.T., Pentateuch, and

Tyndall, John (1820-93), an English physicist, born at Leighlin Bridge, co. Carlow. From 1848-50 he studied at Marburg under Bunsen, and after taking his Ph.D. published, with Knoblauch, On the Magneto-optic Properties of Crystals (1850). He made important investigations in Penrhyn slate quarries, equently in the Alps and Alps with subsequently Huxley, the result of their labours appearing in The Glaciers of the Alps (1860). In 1859 he began his researches on radiation, and later took up the subject of the acoustic properties of the atmosphere. He was president of the British Association at Belfast in 1874, and for some years was scientific adviser to the Board of Trade and to the lighthouse Board of Trade and to the lighthouse authorities. Among his works are: Mountaineering, 1861; Heat as a Mode of Motion, 1863; Radiation, 1865; Fragments of Science, 1871 (6th ed. 1879); Hours of Exercise in the Alps, 1873; Floating Matter of the Air, 1881; New Fragments, 1892.

Tyndareus · (Τυνδάρεος), in Greek mythology, was the son of Perieres and Gorgophone. He married Leda. whom he was the father of

Tyne, a riv. of N. England, formed by the junction of the N. and S. Tyne near the village of Hexham, Northumberland, flowing E. to the North Sea at Tynemanth. Its total length is 45 Its total length is 45 Tynemouth. m., and its principal trib. is the Derwent. Newcastle and South Shields are the chief the. on its banks. N. Tyne rises on the Scottish border, and the S. Tyne has its source near Crossfell in Cumberland.

Tynemouth, a municipal, co., and parl. bor., seaport and market tn. of Northumberland, England, on the R. Tyne. An important watering-place, its sands, about 1 m. long, are overlooked by picturesque cliffs. Shipbuilding is carried on, and there are important fisheries and rope and sail works. sail works. It includes N. Shields. Pop. (1911) 58,816.

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Tynwald, a legislative body of the Isle of Man, which with the lieutenant-governor, the Council, and the House of Keys constitute the government. The Tynwald Court controls the surplus revenue and appoints boards to manage the harbours, high-ways, education, local government, and asylums, subject to the approval

of the lieutenant-governor.

Type, in chemistry, a system used for indicating the structure of com-

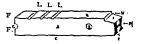
pound bodies, which were regarded as derived from several simple inorganic bodies by the introduction of various radicals. Gerhardt referred almost all substances to four typical molecules, viz. hydrogen, H₂; hydrogen chloride, HCl; water, H₂O; and ammonia, NH, Kekulé added a fifth T., methane, CH, Williamson introduced condensed Ts., and Frankland from the T. theory was led to the theory of valency (q.v.).

Type, in theology, some image pre-figuring an antetype. The term is specially applied to the images found in the O.T. of the persons and things of the new covenant. In the Epistle to the Hebrews the comparison is fully worked out with reference to

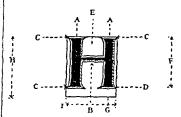
the Atonement.

Type and Typefounding. As in the earliest days of most handicrafts the craftsman made his own implements and apparatus, so in the inception of and apparatus, so in the interpolar typography the printer was his own typerounder, in fact it was not until the 17th century that the arts of printing and letter-founding were separated. In the second volume of Mechanick Exercises, by Joseph Moxon, 1683, is a very full and practical account of the making of type in his day and the process remained in his day, and the process remained much the same until the introduction of machinery for the purpose in the middle of the 19th century, and with some modifications in the mould is still to a minor extent in use for the casting of small quantities of littleused sorts. Before describing the mould it will be necessary to give some account of the matrix, from which the face of the type is cast, and the punch, by means of which the letter is stamped into the matrix. The punch is a rod of steel about 2 in. long by 1 in. square for pica and smaller sizes, and upon the end of this the letter has to be engraved after the face has been ground true on an oilstone. The outlines having been marked out, the counters are struck in with counter-punches; as the work proceeds impressions are taken in smoke on a smooth paper and compared with the model; this refers to hand-cut punches, but towards the end of the last century machinery was introduced produces the punches with an accuracy impossible in hand work. The matrix is a small oblong piece of copper, on one side of which and near one end an impression of the die is struck, after which the matrix requires careful adjusting that the impression may be of the correct depth and be in exactly the right position and in perfect alignment with the rest of the fount. In hand casting the mould was made in two

equal portions, of wood lined with height, they are as follows: A, body iron, and each size of body required a or shank; B, belly or front; C, back; C, face; E, counter; F, feet; G, groove; H, shoulder; I, bevel or beard; K, pin-mark; L, nicks. tions of the mould are joined in posi-tion, with the matrix in its place, a small chamber is left, having for its base that portion of the matrix on which the latter has been struck, and at its top a small hole with a funnelshaped opening, into which the metal is poured as each type is cast, when, with a peculiar jerk of the left hand, which holds the mould, the metal is sent right home to the deepest point in the matrix. When, on the metal cooling, which it does almost at once, the mould is opened, releasing the type with a tag of metal at the foot the small quantity which was in the funnel-shaped opening of the mould this has to be broken away, and afterwards a groove is cut across the bottom of the type where the tag had been. Type casting by machinery is treated together with type-casting and setting machines at the end of this article. The principal description The principal element this article. in type metal is lead, varying from 89 per cent. in Moxon's formula to 55 per cent. in some modern ones, but the proportion is made to suit the size and character of the type to be cast. The other principal ingredients are tin and antimony, besides which, copper, nickel, cobalt, iron, and bismuth have been used. When it is considered that the smallest type runs not less than twenty-four lines to 1 in., it will be seen what accuracy must be maintained in the moulds to get the body of each type to the standard body of each type to the standard size, and in the matrices that the alignment of the face and the thickness of line may be constant. In the list of sizes of type given by Moxon ten only are given, and of these there are two groups of two, of which one is the double of the other, and one group of three, English, two line English, and great Cannon, where the latter equals four-line English, but there is no correspondence between there is no correspondence between the various groups. By the intro-duction from America of the point duction from America of the point system, a method was adopted show-ing the relative sizes of all types, the point being fixed as the 72nd part of an inch, and sizes named by the number of points, thus effecting the standardisation of the depth of the types. The varying thickness or set of different letters is inherent in the alphabet we use; i and w must be cast on different thicknesses of body, but these are now being made proportional. In typefounders' parlance each portion of a single type has its cown name, and in the following block, sponding italic. Besides these faces whose length shows correct type used for bookwork there are very



Type design.—Moxon was right in praising the Dutch typefounders of his day for the 'mathematical regu-larity of their figures,' and 'the true placing of their fats and their leans, with the sweet driving them into one another, and indeed all the accomplishments that can render letters regular and beautiful, do more visibly appear in them than in any letters cut by other people. The names of the various parts of the face of type, as shown in the accompanying block,



are: A, main stroke; B, hair line; C, serifs; D, line; E, counter; F, line to back; G, beard; H, body; I, set. In considering the beauty of type and its legibility there are various things to be taken account of: the correct placing of the line on the body, so that the beard may be deep enough for the descending letters, and in the lower case that the face of the short letters should leave just the right proportion of space for the ascending letters; that the italic, or any other face be i

the bear ' and

be that 'sweet driving of the fats and the leans into one another' Moxon speaks of; and this latter characteristic should also be found in the joining of the serifs to the main stroke. Founts of type used for book-work may be classed as the old face, the old siyle, of somewhat lighter face many fancy faces used for jobbing speed of 3000 per hour for pica or 7000 work, such as circulars, bill heads, for nonpareil; of course, with the larger cards, and advertising purposes, and the above-mentioned, as well as the fancy faces, are made not only to the standard set or thickness, but extended or condensed. The standard tended or condensed. The standard thickness is judged by placing the whole alphabet, a to z, in line, when they should measure about 124 ems of their own body. Again, besides the letter faces of type there are chess and draught faces, playing card and dice faces, music faces, shorthand faces, and many others. The system of logotypes, or types bearing a combination of letters frequently occurring in conjunction, has been tried, notably that under the patent of Henry Johnson, which was adopted by The Times in 1782, but apparently was not found to be so great a success as was anticipated. Indeed, unless such a combination occurs more frequently than the least used of the letters, it cannot be a time-saying device. The logobe a time-saving device. types actually in use are fi. fl, ff, ffi, and fll. See C. T. Jacobi, Printing (5th ed.), and The Times Printing Number, 1912.

Type - casting and Type - setting Machines. When machinery was introduced for type casting, it was necessary to find some means of forcing the metal into the matrix, which in hand casting had been done by a jerk of the hand after the metal had been poured into the mould from the ladle, and the pump was intro-duced for this purpose in the early part of the 19th century. It was also obvious that if any speed was to be maintained it was necessary to cool the mould by some artificial means: the expansion of compressed air was recommended for this purpose by Bruncl, but at the present time water is generally used. The earliest machines for casting type followed pretty closely the hand method, in that the mould was in two parts and was made to approach the nozzle of the pump, to recede from it when the metal had been delivered, to open and elect the type, repeating this action for each type cast. Such machines are still in pretty general use, with the mould working on a pivot to and from the pump, with various cams to effect the opening and closing of the mould and the delivery of the type when cast. They were originally The type turned out by the hand machines, however, needs finishing after delivery. The improved pivotal

sizes of type the production is much slower, as the type in the mould takes longer to cool. The Wicks Rotary longer to cool. The Wicks Rotary Type-casting Machine is a vast improvement on any previous t caster, and is constructed on entirely different principle. Its chief characteristic is the mould wheel, working on a vertical shaft, and having 100 radial moulds whose length is type height, their vertical measurement that of the body to be cast, and their width the set or thickness of the letter; at the end of the moulds towards the shaft are the matrices, which may be different in each mould; at the outer end is the aperture to receive the molten metal. With the revolution of the wheel each mould is presented in rotation to the nozzle of the pump and is filled with the metal. The pump consists of a receptacle in which four plungers work, and into it the metal is sucked through inlet valves, and from it delivered into a pipe fitted with a device for regulating the fluid pressure. As the wheel continues to revolve after leaving the nozzle, the matrices are gradually forced outwards from the shaft, pushing the type before them, till, when it projects from the wheel about 15 in., it passes before a nicking saw which cuts the groove at the foot; after passing a little farther other nicks can be cut by a similar device as required. Having completed a half revolution the type is ejected on to a delivery chain, which is divided into grooves crossways by leaves, which rise to re-ceive the type, which is held in place by a retaining cam to prevent its re-turning with the matrix as it recedes into the mould; from the chain the type is carried to the delivery galley, and the leaves of the chain then fall. According to the size of type to be cast, the mould wheel rewolves from 5 to 10 times per min., thus accounting for from 30,000 to 60,000 perhour. Type-setting machines may be classified into three types:

(a) Those that set type that has been cast by some other machine; (b) those that cast their own type in the order in which it is required for printing the special work in hand; and (c) those that assemble the matrices for a complete line and then cast that line in a single slug. The first mentioned is the made to use power, the various justification of the line by hand, has The type turned out to the first first invention and, necessitating actions being controlled by springs, been very largely supercolled by been very largely superseded by the machines of the other two types. Amongst this first class of machine may be mentioned the Thorne, the Pulsometer, and the Unitype. Of the machines, worked by power and Pulsometer, and the Unitype. Of the water cooled, now turn out the second class of type-setting machines finished type ready for use at the Lanston Monotype may be taken second class of type-setting machines

as an example. sists of two separate parts, the keywhich perforates rolls paper (a translation of the copy into a series of perforations), and the caster, which these perforations guide in its automatic working. The keyboard is similar to that of a type-writer, and the characters are ar-ranged on the same plan, but it is double and contains 276 keys, but by an arrangement of different colours it is indicated whether they belong to roman or italic; caps., small caps., or lower case; figures or sorts. Above the keyboard is a strip of paper which is rolled from one spool to another 1 in. at the completion of each letter. hind the keyboard there is a series of 31 punches, 29 of these working singly and the other two in combination, their relative position indicating the character they represent; one key, the quad, does not perforate. The position of the key struck governs the single punch or combination of The punches brought into use, and its de-pression actuates a valve on the supply of compressed air, which sets in motion the required punches. Whilst the perforations for a line of type are being made a device is counting the number of spaces, and at 5 ems before the completion of the line a bell rings, so that the operator may see if he can complete the word in hand or where he shall divide it, or if the word is completed whether the next will come in complete or divided having included all that the line will contain, the line will need justifying. By pressing the key provided for the purpose the justifying drum rotates until it shows, by means of two figures one above the other, which of the keys upon the top and second row of keys, provided for the pur-pose, are to be used to effect the justification of the line, which is ac-complished by the setting of two differential wedges which divide the surplus space over the number of spaces in the line. The perforated slip is now ready to go to the caster, where it is paid in from the end and works backwards, for it is necessary, as will be seen, that the justification wedges should be in place first or the spaces would not be cast off the The proper die-case, correct width. which consists of a frame 3 in. square, holding the 225 matrices in 15 rows of 15, being selected and put in place, the end of the paper strip is placed under the air pressure bar and the machine started. Under this pressure bar, which is supplied with compressed air, is a row of 31 gradually drawn along it by revolv-holes leading by tubes into eastings ing screws until each meets with the at the back and on one side of the gap where none of its teeth has sup-die-case, in each of which works a port, and so falls into its own channel.

This machine con- piston, two of which are forced upwards by the air from the pressure bar of passing through the perforations proper for those particular pistons which serve to control the die-case when it has arrived in position to the exposed end of the mould, in which the letter is to be cast, in its correct sequence. Other air tubes set contain rods in motion, which result in casting spaces "idth. and in action . line. Of the third class mentioned above the Linotype may be taken typical. In this machine the matrices are small brass plates keyed at the upper end (for purposes of distribu-tion, which will be explained later) with the matrix proper on one of its vertical edges, some having the same letter in both roman and italic, one below the other, on the same edge. The magazine in which the matrices are stored in the machine consists of a flat metal box sloping towards the front and having separate grooves for each character; the matrices tend to slide down these grooves, but are held in check by escapements until released by the action of their corresponding key on the keyboard, which has 78 keys on the same plan as a typewriter. As a key is depressed the corresponding matrix is released from its groove and carried by a travelling belt to a slotted assembly box, where the first word and then by a space band, followed in the same way by other matrices and space bands to the end of the line. When complete the line is considerable to the line is the line the line is carried by special mechanism to the face of a vertical mould wheel, through which is the mould proper for the body to be cast to, the matrices in line forming the type face of the slug or linetype. Whilst here the space bands are forced upwards, thus forming perfectly equal spacing between the words and justifying the line. Behind the mould wheel is the pot of molten metal, which has a delivery mouth to fit against the rear face of the mould, and within the pot a mechanically-operated plunger, by which the mould is filled. The mould wheel then makes a partial revolution, turning the mould slot from horizontal to vertical; the linotype is then pushed out between trimming knives into the galley. The matrices are now mechanically raised and pushed on to the dis-tributor bar above the back edge of the magazine, where they hang by the teeth of their keyed end, and are

means. Typewriter, a writing machine operated by hand for producing

a writing machine characters similar to those of printing. The typewriter in its modern form was invented about 1870 by three men, Sholes, Glidden, and Soule, working together. Their experiworking together. Their experiments were financed by Densmore. Glidden and Soule retired from the experiments, and afterwards Yost was called in to express an opinion as expert mechanic. Acting on his advice Densmore and Sholes took the mechanic to Reminetan Comthe machine to the Remington Company, gunmakers, who had suitable tools for making such a machine tools for making such a machine economically. Remington's took it up and gave it their name; hence the Remington T. It is interesting to note that the three men concerned, Sholes, Densmore, and Yost, all invented other Ts. afterwards. There are about fifty writing machines of various kinds now being made. All Ts. for letter writing agree in having keys which are depressed by the finkeys which are depressed by the finger, thereby setting in action certain levers and causing a letter to make an imprint on paper or other material. The imprint is made either directly on the paper, or an inked ribbon is interposed between the letter and the paper. The paper is clamped round a cylinder called the platen. The letters all strike one spot, so the paper must be moved after each letter is struck. It must move also to allow a space between the words; this is done by a spacing key. The platen is mounted in a carriage which is made to move in the direction of its length, and the platen is made to revolve in the carriage. The movement of the carriage is automatic, and is caused by a coiled tension spring attached to the end of the carriage, which is released every time a letter key or the spacing key is struck. It moves an equal amount each time, the amount being the space of one letter. On account of the spaces being equal, the letter 'i' has a space equal to the letter 'm.' This gives an irregular appearance to the words. and attempts have been made to devise a mechanism which will avoid this, but up to the present no satisfactory result has been obtained. The revolving movement of the platen is made when the carriage is drawn back by hand after the end of a line is

The space bands from which the distances or spacings, called single, matrices were separated on their double, and triple spacing. The spacupward journey are also returned ings are altered readily by an adjust-to their own box by mechanical able stop. The are either (a) type bar machines, or (b) type wheel machines, according to whether the letter is mounted on a lever or on a cylinder. In (a) the key is struck with a stac-cato blow of the finger, while in (b) the key is depressed with a push action. Nearly all modern machines are of the (a) pattern; the Hammond and Blick are the best-known examples of the (b) pattern. In pattern (a) the mechanism consists of two or more levers, the striking letter being situated on the free end of the ultimate lever. In the Oliver machine the letter is situated on the bottom of a U-shaped bar. The U is inverted and the two ends are pivoted in bearings, which makes an exceedingly strong type bar and gives excellent alignment. In some cases the alignment is forced. that is, the type passes through a hole (as in the Yost) or between guides (as in the Smith-Premier and Barlock). This produces good align-ment, but if the type bar does not strike truly the result is either a faint impression or a strain on the finger of the operator. In pattern (b) the mechanism causes the type cylinder to revolve until the correct letter is in the proper position facing the striking point on the platen, and then the cylinder is thrust forward and the impression made. Of course, the whole pression made. Of course, the whole operation is made by a single depression of the key lever. The great advantage of pattern (b) is that a cylinder may be removed in a few moments and another cylinder with entirely different type inserted. This gives a wide range of types on the same machine. The impression is made on the paper in ink. Machines made on the paper in ink. Machines are pad or ribbon machines. In pad machines the letter on the type bar takes the ink from the pad and impresses it on the paper; in ribbon machines an inked ribbon is interpreted by the page of the paper. It posed between the letter and the paper, and the impression is made by the letter striking the ribbon. The clearest writing is made by pad machines on account of the letter striking directly on the paper. The Yost is the best-known pad machine, nearly all others being ribbon machines. The ribbon is mounted on two spools which revolve automatically through a small are when the key lever is de-pressed, so that the letter strikes a fresh part of the ribbon each time, otherwise a hole would be made in the ribbon after a few blows. When reached. The mechanism causes the the ribbon after a few blows. When platen to revolve a certain fixed distance, and this distance determines one spool, a ribbon shift key reverses the space between the lines. Usu-the motion and the ribbon moves in ally there are three of these fixed the opposite direction. The letters

on the keyboard are not arranged clis for duplicating work is an impor-alphabetically, but an arbitrary ar-rangement has been adopted whereby Oliver machine is pre-eminent in the letters most used are in the middle and therefore directly under the fingers. Several arrangements have been suggested, the one now generally adopted being as follows:---

qwertyuiop asdfghjkl zxcvbnm

The numerals, punctuation marks, The numerals, punctuation marks, and other figures are placed in different positions on different machines. The keyboards are single or double. In the single keyboard machine each type bar has two or, as in the Oliver, three letters affixed to it, and a shift key throws the carriage backwards or forwards in order to bring the paper in the correct position under the letter. correct position under the letter. The keys are marked with letters and figures similar to those on the corre-sponding type bars. In the single keyboard machine the key must be marked with the several characters marked with the several characters which are affixed to the type bar, but the same letter stands for both capitals and small letters. In double keyboard machines each type bar has only one letter, and there is a key to each. A greater speed is obtained with the single keyboard machine as with the single keyboard inactine as the fingers have to memorise fewer keys, and this more than compen-sates for the additional labour in depressing the shift key. Ts. are 'visible' or 'blind.' Until recently most machines were 'blind,' that is, the writing was made from below upwards, the letter striking the bot-tom of the platen, which made it necessary to lift the carriage in order to examine the writing. In the 'visible' machines the writing is done in sight and the ribbon must be removed immediately after the impression is made, which necessitates a ribbon throw mechanism. The general de-sign of the T. seems to be fixed, but many small improvements are made, some being valuable, while others are merely 'selling points.' One valuable addition is a back spacer. The depression of a key throws the carriage back one space, so that a which has beén written letter wrongly (the most frequent error in typing) or missed out can be corrected with the least possible waste of time. The platen is frequently made to revolve independently of the crossing retehts which analyses the wrongly (the most frequent error in typing) or missed out can be corrected with the least possible waste of time. The platen is frequently made to revolve independently of the spacing ratchet, which enables the operator to write exactly on the date line. Tabulators are now incorporated with nearly all machines, and are indispensable for accountancy and suchlike work. The cutting of sten-

this respect on account of the type bar already referred to. When only a few copies of a letter or document are required, carbon paper may be inserted between sheets of writing paper, and in this manner as many as twelve copies of one original may be made with thin paper and carbons. Carbon copies are frequently used for office filing, thus taking the place of the letter book. The speed obtainable depends on the skill of the operaable depends on the skin of the opera-tor rather than on the make of the machine. An expert can write about 150 words a minute. The price of Ts. is very high compared to the cost of manufacture. A standard ma-chine costs £23 less 5 per cent., while the actual cost of making varies be-tween £3 and £4. This is due to several of the largest firms combining to keep up the price.

Typha, a genus of aquatic plants with sword-shaped leaves and long cylindrical brown spikes of female deciduous spike of male flowers, surmounted by a slender deciduous spike of male flowers. T. latifolia, great reed mace, cat's-tail, or 'bulrush,' is a large and handsome plant, the down of which was formerly used in stuffing pillows and

mattresses.

Typhaceee, a small older, aquatic plants, with only two genera, burweed.

ERIC FEVER. mythology, was a monster with a hundred heads who was subdued by Zeus and buried in Tartarus under Mt. Ætna, the workshop of Hophæstus. According to Homer, he was concealed in the earth in the country of the Arimi, which was lashed by Zeus with flashes of lightning. He was the youngest son of Tartarus and Graa, and by Echidna became the father of the dog Orthus, Cerberus, the Lemman hydra. Chimper and the the Lernman hydra, Chimmera, and the Sphynx. He also begot the dangerous winds, and is sometimes called the father of the Harpies. Typhoons, small cyclones occurring

in the tropics, particularly in the China Sca, from July to November; as hurricanes they occur in the W. Indies. Normally the air of the tropical belt shows little cyclonic disN.E. course. Ts. are notable for the patch of clear blue sky in the central calm area, which is nevertheless dangerous to sailing vessels; these are unable to keep way in the midst of great waves, and may be struck again at any moment from any direction as the storm travels on. The rapid fall of the barometer gives short warning of approach, but the navigator may be sure in his calculation of wind direction and find the safest path. To sailing vessels they are very dangerous, but modern steamers can negotiate all but the most severe. In the China Sea and Gulf of Mexico they are of sufficient violence to give rise to 'tidal waves,' which are destructive

are of sufficient violence to give rise to 'tidal waves,' which are destructive to ports and shipping.

Typhus Fever (Gk. τύψος, mist or stupor), an acute contagious disease, characterised by a high fever, severe nervous symptoms, and a peculiar rash. It is undoubtedly caused by the action of a specific micro-organism, but, as in smallpox, mumps, measles, and whooping cough, the causative bacillus has yet to be discovered, though there are reasons why the diplococcus exanthematicus of Dubieff and Bruhl should be regarded as connected with at least some of the symptoms. The disease has been known in Europe since the 11th century. The conditions predisposing to the disease are poor hygienic conditions, over-crowding, starvation, etc. Researches by Prof. Matthew Hay appear to indicate that the extinct appear to indicate that the action of ficas is a necessary preliminary to the disease, and that contagion is effected by fica-bites. The mortality has been estimated at about 18 per cent. of cases, but the rate depends considerably upon the facilities for proper treatment. The period of incubation is usually from seven to ten days, during which only a slight general debility is observed. The fever is ushered in with rigors, after which the temperature rises to 103° or 105°, attaining a maximum about the seventh day, after which it remains steady or gradually becomes lower. The tongue fleas is a necessary preliminary to the gradually becomes lower. The tongue is first of all coated with a white fur, which afterwards becomes yellow or The teeth are coated with sordes. There is usually a degree of constipation and the urine is scanty. At the fourth or fifth day the characteristic eruption appears. This consists of spots or blotches of rose colour, appearing chiefly on the abdomen and flanks; they are for the most part petcehial in character, that is, they consist of subcutaneous effusions of blood The actions and the consist of subcutaneous effusions of blood The of blood. The patient is very feeble and generally in a state of wakeful stupor, staring with contracted pupils and diminished capacity for perception. The crisis, which occurs about

N.E. course. Ts. are notable for the patch of clear blue sky in the central calm area, which is nevertheless dandam area, which is nevertheless dandam alloration of the distressing gerous to sailing vessels; these are unable to keep way in the midst of unable to keep way in the midst of great waves, and may be struck again nursing, fresh air, and a milk diet.

Tyr, in Norse mythology, a son of Odin, and god of war. His right hand is sacrificed in the struggle with the monster Fenriswolf, the son of Loke, in the great battle between the good and evil principles. He succeeds in slaying Garm, the terrible hound of the Gnipa cave, but receives his death-wound in the conflict. From his name is derived the word 'Tuesday,' through the Anglo-Saxon Tiwes day,' thry's day.

his name is derived the word Tuesday, through the Anglo-Saxon Tiwes day, Tyr's day.

Tyrannion (Tuparviw), a Greek grammarian, a native of Amisus in Pontus, whose real name was Theophrastus. He studied under Hesticeus of Amisus and Dionysius the Thracian, and in 72 B.C. was taken captive by Lucullus, who brought him to Rome. There he occupied himself with teaching and in arranging the library of Apellicon, which had been brought to Rome by Sulla. He was also engaged by Cicero, who speaks of him in the highest terms, on a similar task, and acted as instructor

comman case, and acced as instructor to Cicero's nephew Quintus.

Tyrant (Gk. τύραντος), a species of monarch among the ancient Greeks, the irresponsible dominion of one man. Men of courage and ability, not unfrequently members of the aristocracy, availed themselves of the discontent of the people in order to win popularity, and then with their help overthrew the existing authority and possessed themselves of the government. The Ts. exercised their authority often in their own interests, but when they did not misuse it the people on the whole fared better under the new rule than under the old, while it also served to remove existing anomalies, and to make room for fresh developments. Such tyrannies arose most commonly in the 7th and 6th centuries B.C., and many of the Ts. of this time have earned a high reputation by the impetus they gave to trade, commerce, and architecture, and by their encouragement of art. The dislike of monarchs in general, however, led men to associate the name of T. with the idea of a cruel and arbitrary ruler, and its modern bad meaning is also largely due to the ultra-constitutionalists of the 4th century in Athens, to whom the democracy of Pericles was the ideal of government.

Tyrant Birds, or Tyrranidæ, a large family of American birds resembling the shrikes in appearance and habits. During the breeding season, the males are remarkably bold and fierce. The

bill is long, with a hooked tip, the tail are produced near Meran and Botzen. is slightly forked, and the wings are long and pointed. The birds are entirely insectivorous in habit, and some species cause considerable loss

to bee-keepers.

Tyrconnel, Richard Talbot, Earl of (1630-91), born in Ireland. In 1687 was made lord-deputy of Ireland. He fought hard against the Protestant ascendency, and when William raised the siege of Limerick, fled to France. to return in 1691 with small authority. He died the same

Tyre (modern Sur), an ancient tn. of Syria, built partly on an island and partly on the mainland. It was the principal scaport of the Phonicians. and equally important when the Greeks became acquainted with it but was sacked by Alexander in 322 B.C. and lost its former importance. It was, however, a flourishing port under the early Roman emperors, and a place of considerable importance in mediæval history, especially as the stronghold of the crusaders (1124-1291). But after the fall of Acre the Christians deserted the place, which was then destroyed by the Moslems.

Tyree, or Tiree, an island of the Inner Hebrides, Scotland, co. Argyll. Hynish in the S. has granite quarries.

Pop. (1911) 1825.

Pop. (1911) 1825.

Tyrol, or Tirol, the most southerly prov. of the Austrian empire, bounded on the S. S.E., and S.W. by Italy. It has an area of 10,307 sq. m., and is traversed from W. to E. by the main chain of the Alps, the loftiest peak being Ortler (12,802 ft.), which belongs to a group lying S.W. of the Adige on the frontier of Lombardy. The other groups of mountains are The other groups of mountains are the Octzthal, Stubai, and Zillerthal Alps, which connect the Rhætian Alps of Switzerland with the Hohe Tauern in the E. of the T., where they attain their culminating point, they attain their culminating point, Gross-Glockner (12,455 ft.), on the frontiers of T., Salzburg, and Styria, and separate the valley of the Inn in the N. from the valley of the Drave and Adige in the S. Besides the rivers already mentioned, the N.W. is watered by the Ill and Bregenz, flowing into Lake Constance, which forms the N.W. boundary. The climate is severe in the unlands, but in ate is severe in the uplands, but in the narrow valleys of the S. there is a warm climate similar to that of Lom-. T. is above all a pastoral the cattle as in other Alpine land, the cattle as in other Alpine lands being the mainstay of the peas-ants; but forestry also employs a

There are also factories for preserved fruits and tobacco. Capital, Inns-bruck. T. was in Roman times in-habited by the Rhætians. It passed into the possession of the House of Hapsburg in the 13th century. Pop.

Tyrone: Tyrone: 1. A co. in the prov. of Ulster, Ireland, bounded N. and W. by Donegal, S. by Monaghan and Fermanagh, E. by Lough Neagh and Armagh. It is hilly in the N. and S., the principal ridges being the Sperin Mts. (2240 ft.) in the N.E. and the Slievebeagh (1255 ft.) in the S. The principal rivers are the Foyle and the Mourne flowing into tributaries of which are the Strule and the Derg and the Blackwater. There are a few lakes, of which Lough Neagh is the largest. In the E. is a fertile plain, and agriculture flourishes. Oats is the chief grain crop, and potatoes and turnips are grown; a considerable area is occupied pasture, and cattle are reared in large numbers; poultry are also Linens and coarse woollens (including blankets), soap, candles, and earthenware are manufactured. The county is divided into eight baronics and returns four members to parliament. There are several interesting ruins in the county. The area is 1260 sq. m. Pop. (1910) 142,437, decreasing owing to emigration. Omagh is the county town. 2. A bor. of Blair co., Pennsylvania, U.S.A., on the Little Juniata R. It is situated at an eleva-tion of 910 ft., and is an agricultural district. Limestone is found, and coal is brought here from the Clearfield coal mines. A considerable trade in lumber is carried on, and the Pennsylvania Railway has repairing shops here. Pop. (1910) 7176.

Tyrone, Hugh O'Neill, Earl of (c. 1540-1616), an Irish rebel, frequently engaged in intrigues against the Company of the Property of the Pr

blizabeth. He eventually promised submission, but afterwards regarded with suspicion and forced to flee in 1607, dying at Rome. His nephew, Owen Roc O'Niell (c. 1590-1649), fought in Ireland in 1642, being chosen general by the Ulstermen, and was successful against the English

and Scots.

Tyrrell, George (1861-1909), an Irish divine, born in Dublin. He entered the Speicty of Jesus and passed his novitiate with that order. Later he became teacher of philosophy at Stonyhurst. His writings demonstrate the powerful effect upon him of the work of Cardinal Newcertain proportion of the population, man. His best known writings are: and the saltworks of Hall, near Inns-Nova et Vetera; The Faith of the bruck, are famous. Silk-spinning Millions; Hard Sayings; Through is carried on in the S., and good wines Scylla and Charybdis (wherein he

Tyrtæus, son of Archembrotus of Aphidnæ in Attica. According to the older tradition, the Spartans during the second Messenian War were compress of China, born of humble manded by an oracle to take a leader parents, but being sold as a slave became the property of a famous who gave her as a present to from among the Athenians, where-upon they chose T. Later writers represent T. as a lame schoolmaster, Literature.

Tyrwhitt, Thomas (1730-86), an English classical commentator, born in London. He was master of both English and classical literature, and published editions and emendations of classical authors, including: Aristotelis de Poetica Liber, Græce et Latine, 1794; De Lapidibus, 1781; Observations . . . upon . . . Shake Observations . upon . . Shake-speare, 1766; The Canterbury Tales of Chaucer, 1775; and Poems supposed exposing the Rowley forgeries, 1777 and 1778.
Tytler, Patrick Fraser (1791-1849),

Tytler, Patrick Fraser (1791-1849), Russo-Japanese War the Liberal and was called to the bar in 1813. Began its work. Her death in 1908 Among his many writings are an Essay on the History of the Moors in Spain, The Life of the Admirable Crichton (1819), History of Scotland away the last prominent representative of the Old era in China. (1828-43), and England under the Reigns of Edward VI. and Mary (1839). His History of Scotland, which was the result of twenty years of study and research, is still authoritative.

Tytler, William (1711-92), a collection of mythical and legendary saccottsh historian, born in Edin-

Tytler, William (1711-92), a a colle Scottish historian, born in Edin-tales.

evolved his idea of revelation as burgh. He published: The Inquiry experience); and Mediævalism.

Tyrrhenian Sea (ancient Tyrrhenum Mare), that part of the Mediterranean Sea between Italy and the islands of Corsica, Sardinia, and Sicily.

Tyrtæus, son of Archembrotus of Archembrotus of Archembrotus of Archembrotus of Tyrtæus, son of Archembrotus of

Tzar, see Tsar. Tzarskoye, see Tsarskoye Selo. Tze-Hsi (1834-1908), Dowager Emgeneral, who gave her as a present to the Emperor Hsien-Feng. He was so represent T. as a lame schoolmaster, the Emperor Hsien-Feng. He was so of low family and reputation, whom the Athenians purposely sent to the Lacedæmonians as the most inefficient leader they could select, being unwilling to assist them in extending their dominion in the Peloponnesus, but little thinking that the poetry of T. would achieve that victory. See Murray, Ancient Greek Literature. capacity for her nephew. same Kwang-Hsu. She was a woman of great power and ability, and when in 1898 the emperor endeavoured to shake himself free of her influence and to institute reforms he found himself a prisoner in the Summer Palace. But the unpleasant impres-Palace. But the unpleasant impression produced by these measures ultimately came to a head, and in 1900 the Boxer Rising took place, which was only suppressed by the interto have been written . . . by Thomas vention of foreign powers. After Rowley, which was the chief work this the power of the empress declined, for China began to realise the necessity for reform, and after the Russo-Japanese War the Liberal

the twenty-first letter of the English alphabet, and the last of the five vowel sounds, intimately con-nected with v and w. With the former of these the symbol u was interchangeable until the spelling settled down at the end of the 17th century. The original sound of M.E. short u is pre-The served in such words as put and pull, while provincial pronunciation retains it more widely. For the pronunciation of u the breath passage is
wider than for that of any
vowel, and hence its tone is lov

while provincial pronunciation to death on a charge of comwas pardoned in 1592. He wrote
The Key of the Holy Tongue, a Riebrew
dictionary (pub. 1593). vibrant.

Ubeda, a city of Spain, in the prov. of Jaen, on the Guadalquivir, in a fruit-growing and vine district. has linen and esparto-grass industries. There is a cathedral and interesting old Moorish walls. Pop. 20,000.

Ucayali, a riv. of Peru, E. of the Andes, unites with the Marañon to form the principal stream of the Amazon, 900 m. from its source. is navigable to Sarayacu. Leng (estimated) 1500 m. Length

Uccello, or Ucillo (1396-1475), the me given to the painter and name given the painter and sculptor, Paolo di Dono, from his love of painting birds. He was born in Florence, and became one of the assistants of Lorenzo Ghiberti in conassistants of hotelize difficult from the baptistery. His 'Battle of Sant' Egidio' (1416) is in the National Callery, London; his 'Equestrian Portrait of Sir John Hawkwood' (1436) is in the Duomo, Florence, which electronians some of his also contains some of his which frescoes.

Uccle, a tn. of S. Brabant, Belgium, m. S. of Brussels. Pop. 26,000.

Uchi, or Yuchi, a N. American tribe which formerly occupied Georgia and S. Carolina. By the end of the 18th century they had moved west-wards of Chattahoochee, and are now

8 m. N.E. of Lewes.

3344.

Udaipur, Oodeypore, Obeypoor, or Memoirs of him by F. A. Lauge,
In the Rajputana district, India.

State, area 12,700 sq. m.; pop.
1,030,000. The capital, Udaipur, is
situated on Lake Pichola.

Pop.

200 m. N. of Orenburg, It is walled and defended by a citadel. The

Udall, or Uvedale, John (c. 1560-92), a Puritan divine, who was prosecuted (1586) and deprived (1588) of his living at Kingston-on-Thames for his tracts against episcopacy. He then preached at Newcastle in Northum-

berland, until in 1590 he was con-demned to death on a charge of com-

dictionary (pub. 1593).

1 seaport tn. of Goto45 m. N. of GothenIt has shipbuilding, wool and burg.

textile industries, and exports timber and oats. Pop. 12,581.

Udal, see Allodium.

Uddingston, a tn. of Lanarkshire, Scotland, near the R. Clyde, 7 m. S.E. of Glasgow by rail. It manuis. agricultural implements. Pop. (1911) 7500.

Udine, an Italian tn., 60 m. N.E. of Venice. It contains an old castle, once the residence of the patriarchs of Aquileia and now a prison; a cathedral, containing fine sculptures and paintings; law courts, a town hall, and various hospitals. It manufactures silk and leather goods. Pop.

25,000. Udong, a tn. of Cambodia, French Indo-China, on a trib. of the Toule-sap, 25 m. N.W. of Pnom-penh. It was the cap, of Cambodia until 1866. About 5 m. to the N. are the remains of the triple walls which surrounded the town of Cambodia or Lovek. Pop. (estimated) 16,000.

Ueberlingen, a tn. of Baden, Germany, on an arm of Lake Constance, 8 m. N. of Constance. It manufs. linen, hosiery, and tobacco.

Ueberwog, Friedrich (1826-71), a German philosopher, born at Leich-lingen, Prussia; educated at Got-Uklanoma.

Uckermünde, a tn. of Pomerania,
Prussia, at the mouth of the Ucker,
32 m. N.W. of Stettin. Pop. 6252.
Uckfield, a market tn. and par.,
Sussex, England, on the R. Ouse,
8 m. N.E. of Lewes.
Pop. (1911)
Sophie (1863-66; 8th ed. 1894-98:
Line of Lewes. 1911) sophie (1863-66; 8th ed. 1894-98; English trans. by Morris, 1871). See Memorrs of him by F. A. Lango, 1871,

and there are six churches, a number and there are six churches, a number of mosques, and two convents. A considerable trade is carried on in corn and cattle. About half of the inhabitants are Tartars. Pop. 96,295.

Uganda, a British protectorate in Uganda, a British protectorate in Central E. Africa, bounded on the S. by Lake Victoria Nyanza and German E. Africa; on the W. by Lake Albert Edward, the R. Semliki, Lake Albert Nyanza, and the R. Nile; and on the E. by Lake Rudolf. In 1890 U. placed itself under the control of the Imperial East Africa Company, and in 1895 was converted into a separate protectorate of the British empire, with its headquarters at Entebbe, on the N.W. coast of the Victoria Nyanza, and 20 m. S. of the native capital, Mengo. In 1900 U. was divided into six provinces, and in 1902 the Eastern province was transferred to the British E. Africa Protectorate. The government now consists of a commissioner and consulgeneral, who represents the imperial government, and is nominally com-mander-in-chief of the army. He is supported by a deputy-commissioner and three sub-commissioners, who are placed over three of the five proare placed over three of the five provinces, U. proper being regarded as the 'home' province, since it holds the residence of the commissioner. These are assisted by collectors and assistant-collectors, who act as magistrates, and numerous other departments. The Hamitic races invaded II about 5000 years are thereby U. about 5000 years ago, thereby modifying the ethnological features of modifying the etimological reatures of the country. In 1857 Mutesa, king of U., entered into political relations with the British agent at Zanzibar. Sir H. M. Stanley visited the country in 1875, and on the invitation of the king introduced Anglican missionaries. Immediately there commenced arisolar between the commenced a rivalry between Protestants, Roman Catholics, and Mohammedans. Mutesa was succeeded Mwanga, who commenced a series of terrible and bestial orgies, which resulted in Mohammedans and Christians uniting to depose him, where-upon he fied and placed himself under the shelter of a Roman Catholic community, at the same time espous-ing that faith. Then commenced a struggle between Mohammedans and Christians, resulting in the temporary supremacy of Islam. This was followed by various attempts of adventurers and missionaries to gain political influence for their various countries. Mwanga had been replaced on his throne and all differences settled by 1895, when U. was declared a protectorate. The pioneers in the

Bishop of Orenburg and a Moham-| Cunningham. Berkeley was the first medan mufti have their seat here: commissioner, and gradually U. advanced in prosperity, after the rebel-lion of 1897 and the Sudanese mutiny were quelled and Mwanga deposed and deported to the Sevchelles. Christianity has now the predominant Christianity has now the predominant influence, there being over 300,000 adherents. The climate varies, and the country is divided by the Rift Valley. The chief mountain is Mt. Elgon, while the country is watered by the R. Kagara and the lakes above mentioned. There is a large mineral and the lakes above mentioned. reserve, including gold, copper, iron, and graphite. Blacksmithing, bricklaying, pottery, weaving, and cotton growing are now practised by the natives, under the tuition of the

natives, under the tuition of the missionaries. See Speke, Discovery of the Sources of the Nile; Wilson and Felkin, Through the Dark Continent; Sir H. Johnstone, The Uganda Protectorate; Sir F. Treves, Uganda. Uggione, Marco da, also written Oggione (c. 1480-1530), a Milanese painter; a pupil and imitator of Leonardo da Vinci. His chief works are the two copies of Da Vinci's 'Last Supper,' the original being lost. One cony is in London. He also executed copy is in London. He also executed an altarpiece at Milan, and 'The Three Archangels,' his best original

work.

Work.
Uglich, a tn. of Yaroslav gov.,
Russia, on the r. b. of the Volga, 67
m. S.W. of Yaroslav. The town is
very ancient and contains a 13th
century cathedral, two monasteries,
and the palace of Prince Demetrius,
who was killed here in 1591. It has a large trade and numerous manufs.

Pop. 9698. Ugolino della Gherardesca (d. 1289), immortalised in Dante's Inferno as Count Ugolino, was a Neapolitan who endeayoured to usurp the government of Pisa. Succeeding after some time in this attempt, he governed the country with great vigour. The Archbishop of Pisa, Roger de' Ubaldini, formed a conspiracy against him in 1288; and attacking U. in his palace, defeated and took him prisoner. He was eventually starved to death.

Ugrian, the name applied to a Finno-Turki family originally found E. of the Urals. The chief branches are the Finns, the Ostiaks, the Voguls,

and the Magyars.

Uhde, Fritz Karl von (b. 1848). a German painter, born at Wolkenburg, Saxony; studied at Dresden, Munich, and Paris, and served in the army. His work is based on naturalistic principles.

Uhland. Johann Ludwig (1787-1862). German poet, born at Tübingen where he graduated in law (1810), and later became professor of German advancement of U. were Grant and literature (1829-33). After a sojourn

in Paris, during which he spent most | Eaval (1138 ft.), and on the E. has of his time studying mediæval literature, he took up an appointment in the law courts at Stuttgart (1812-14). By this time he had already written a number of poems (since 1807), and an historical thesis, Das Allfranzösische Epos (1812). In 1815, having decided to take up literature as his profession, he published a collection of his poems, Gedichte, which went through about fifty editions during his lifetime. This was followed by two dramas, Ernst, Herzog von Schwaben (1818), and Ludwig der Baier (1819), which although fine in sentiment are not suited for stage production. poems are mediæval in spirit, and are typical product of Romanticism, although of perfect finish. Besides U.'s literary exertions, he figured with some prominence in political life, being a member of the Frankfort Par-liament in 1848. See Life by H. Fischer, 1887, who also edited his works, 6 vols., 1892.

Uhlans were originally cavalry men employed in reconneitring, out-The name is partipost duty, etc. cularly applied to the Prussian cavalry, who are armed with the

a par. of Lewis Is., Or Scotland, 34 m. W. Uig, Outer Stornoway, It contains remains of the shrine of St. Catan. Pop. (1911) 4462.
Uigurs, an historical Turkish race who inhabited. Factors.

who inhabited Eastern Turkestan. They were the founders of the king-dom of Hiong-Nu, the southern empire of which was destroyed by the Tunguses in the 3rd century A.D.
The southern U. then founded the
kingdom of the Huns. The northern U. were at the zenith of their power and civilisation in the 5th century A.D. They became followers of Islam, but their religion shows Buddhistic, Chinese, and Zoroastrian influences. They probably taught Syrian writing to the Mongols and Manchus. The race is now merged with surrounding peoples. See the works (German) of Klaproth, Vánbéry, Schott, and Vánbéry, Klaproth, Radloff (Aus Sibirien).

uintah, a lofty mountain range in Wasatch co., Utah, U.S.A., extending into Wyoming. The highest points are Gilbert Peak (13,694 ft.), Emmons Peak (13,694 ft.), Mt. Hodges (13,500 ft.), and Dawes Peak (13,300 ft.). The Green R. and the Uintah R. have cut deep gorges in

the range.

two islands of the Outer Hebrides, Inverness-shire, Scotland: recommended.

1. N. Ulst lies 8 m. S.W. of Harris, and is separated from Skye by the Little Minch. It is 18 m. long, and from 3 to 14 m. wide. It is very hilly in the W., the highest peak being Mt.

the two sea lochs of Eport and Maddy. Pop. (1911) 3677. 2. S. Uist is situated 36 m. S.W. of N. Uist, and has a maximum length and breadth of 22 and 8 m. The principal sea lochs, Boisdale, Skiport, and Lynort, are on the E. coast. The chief occupation of the islanders is fishing. Pop. (1911) 5383.

Jitenhage, a tn. in the dist. of Uitenhage, Cape of Good Hope, S. Africa, 21 m. by rail N.W. of Port Elizabeth; has railway works and wool cleaning. Pop. 12,200.

Ujiji, a tn. in E. Africa, on the eastern shore of Lake Tanganyika, belonging to Germany. It is the terminus of a carayan trading route from Zanzihar. Formerly there was from Zanzibar. Formerly there was a slave market.

Ujjain, or Oojein (Gk. Ozene), a city in Gwalior state, Central India, 32 m. N. of Indore. It was the capital of Malwa under Akbar, and is a sacred city. It exports opium. Pop. 40,000. Ukase, a term applied in Russia to

all legislative or administrative orders or edicts proceeding from the Czar or

the Senate.

Ukraine, a part of Poland. The term was first applied to the Tartar frontiers of Poland, and later to the district about the middle Dnieper. In the 17th century the portion E. of the Dnieper passed to Russia, and forms Little Russia. At the second partition of Poland (1793) the western portion also passed to Russia.

Ulcer, a gradual destruction tissue as a consequence of infection or injury. The difference between ulceration and gangrene is that, in the former, the disintegrated tissues are cast off in liquid form as a discharge, while in gangrene visible portions of tissue are detached. In most cases, an U. is a healing process by which diseased tissue is gradually dissolved in an 'ichor,' while the area of the sore diminishes, a scar or cicatrix taking the place of the ulcerated surface. In some cases the toxic element is too powerful for the normal healing process, and the U. tends to spread, the discharge itself being specially infectious. The best treatspecially infectious. ment is dressing with an antisoptic such as boric acid. Caustics and astringents such as silver nitrate are often useful. As ulceration is frequently accompanied by an enfeebled state of the system, the administration of a general tonic, such as Easton's syrup, is to be

268,226. 2. Chief th. of above; a sea-port at mouth of R. Ulea in Gulf of Bothnia, with trade in wood, tar, and pitch. Pop. 20,000.

Ulema, the collective name of a certain class of theological jurists in Turkey, who, as is the case in Mohammedan countries, derive their decisions from the Koran and its commentaries. The U. enjoys many commentaries. The U. enjoys many privileges; he pays no taxes, cannot be condemned to death or deprived of his property by any court of law. He can only—eventually—be deposed and banished. The U. have to recognise, save their two immediate superiors (the kadiasks or kadilesks), only the mufti as their chief authority, whilst they are the chief authority, whilst they are the superiors of all the Mullahs in the different provinces.

ullex, an important genus of Leguminosæ, found in W. Europe and
N. Africa. Three species occur in
Britain, and are known popularly
as the gorse, furze, or whin.
Ulfilas, Ulphilas, Wulfilas ('little
wolf') (c. 311-385), the celebrated
translator of the Bible into Gothic.
Consecrated bishop in 348 he was
expelled by his heathen compatriots
from his native place, and sought from his native place, and sought refuge in Lower Mosia, where he re-In 385 he mained for thirty years. In 385 he went to Constantinople (whither he had gone once before in 360 to assist at a council), and died there shortly afterwards. He was one of the chief lights of Arianism, in the interest of which he exerted himself with the utmost energy. His greatest work, however, is his Gothic transla-tion of the Bible, a work by which he contrived both to fix the Gothic language and to perpetuate Christi-anity among the Gothic people.

Uliasvitai, or Ooliasutaia, a tn. in N. Mongolia, China, 1100 m. N.W. of Peking, is a trading centre and a garrison town. Pop. (estimated) 4000.

Ullapool, a vil. of Ross and Cromatry Scotland on Loch Processing Control of Ross and Cromatry Scotland on Loch Processing Control of Ross

Ulimann, Karl (1796-1865), a German Protestant theologian, born at Epfenbach, Bavaria. He studied at Heidelberg and Tübingen; going to Halle to lecture in 1829. In 1836 he was invited to a chair at Heidelberg. U., with the assistance of Umbreit, started the Theologische Studien und Kriliken in 1828. He wrote strongly in favour of freedom in theological teaching.

Ulloa, Antonio de (1716-95),

of Laponia, the fertile lowlands of Spanish naval officer and scientist, Osterbotten on the Gulf of Bothnia, born at Seville and entered the navy, and the plateaux (1500-1640 ft.) of In 1735 he went to S. America with Saomanselka and Kajana. Pop. a French scientific expedition. He became rear-admiral in 1760, gover-nor at Louisiana in 1764, and lieu-tenant-general in 1770. In 1780 he was tried before a court-martial for failure in a secret expedition to Florida, and afterwards retired.

Ullswater, the second lake in England, between Westmorland and Cumberland, 5 m. S.W. of Penrith, 8 m. long by ½ m. broad and 210 ft. deep. Aira Force (80 ft.) falls on the W. side, and it receives the Patterdale Beck. It contains several small islands and has very varied

scenery.

Ulm, a first-class fortress and riverport of Würtemberg, Germany, in the circle of the Danube and on its left bank at its confluence with the Blau, 46 m. S.E. of Stuttgart. connected by bridges with Neu-Ulm. in Bavaria. It is included in the fortress district of Mainz and serves as a permanent camp. It contains the largest Protestant church in Germany, and has manufactures of hats, tobacco, pipe-bowls, machinery, instruments, and textiles. Pop. 56,109.

Ulmus, see Elm.

Ulphilas, see Ulfilas.

Ulpian, or Domitius Ulpianus, a Roman jurist of the 2nd and 3rd centuries A.D., born at Tyre. He was assessor in the auditorium of Papinian under Septimus Severus; associate justice under him and Caracalla, and chief adviser and pretorian prefect to Alexander Severus. He wrote many works, extracts from which form a large part of Justinian's Digest.

Ulpianus of Antioch, a rhetorician, the contemporary of Constantine the Great, is the reputed author of Prolegomena, and a commentary on the Olynthiac and two of the Philippic orations of Demosthenes. There are also attributed to him commentaries on the orations of Demosthenes commonly called Symbulentici, and on the Oration of the Crown and the Oration against Leptines. These com-Ullapool, a vil. 01 Ross and on the Oration of the Crown and on the Oration against Leptines. These comhas important fisheries. Pop. (1911) mentaries were printed in Dobson's Collection of the Attic Orators.

Ulrica Leonora the Elder (1656-93), Queen of Sweden, daughter of Frederick III. of Denmark, wife (1680) of Charles XI. of Sweden and mother of Charles XII. and Ulrica Leonora the Younger.

Ulrica Leonora the Younger (1688-1741), Queen of Sweden, daughter of Charles XI. and sister of Charles XII. She acted as regent during her brother's absence in 1714, married Prince a Frederick of Hesse in 1715, and on her brother's death was elected (1719) air, but is decomposed even by weak Queen of Sweden by the Riksdag. In acids. Aluminium, silicon, sodium, 1720 she abdicated in favour of her and sulphur are its chief constituents.

husband. Ulrich von Hutten, see HUTTEN,

ULRICH VON.

Ulrici, Hermann (1806-84), a German philosopher, born at Pförten; educated for the law at Halle and Berlin. In 1834 he became professor of philosophy at Halle, and remained there till his death. His works include: Geschichte der Hellenischen Dichtkunst, 1835; Ueber Shakspeare's Dramatische Kunst, 1839; Ueber Prin-cip und Methode der Hegelschen Philo-

sophie, 1841; Das Grundprincip der Philosophie, 1845-46. Ulster, the northermost of the four great divisions of Ireland, bounded by the Atlantic Ocean, North Channel, Irish Sea, Leinster, and Connaught. It was one of the most ancient divisions of Ireland, and was the seat of the O'Neills. The N.E. part was for long a seat of English power in the N., but until the Planta-tion of U. in the reign of James I. no permanent settlement was made in the rest of U. Emigration has always been a drain on the population of the province, which decreased from 1,914,236 in 1891 to 1,582,826 in 1901. Nevertheless, the province is pros-perous, flax-spinning being the most important industry next to agricul-Iron and salt are worked in Antrim, and stone and various kinds of clay for bricks, etc., in other parts.
U. has always, owing to the preponderance of Protestants, professed itself willing to resist Home Rule à outrance. The province is divided into Belfast and Londonderry county boroughs and the counties of Antrim, Armagh, Cavan, Donegal, Down, Fermanagh, Londonderry, Monaghan, and Tyrone. See separate articles on these. Total area 8613 sq. m. Pop. (1911) 1,581,696.

Ultimus Hæres ('last heir'), in Scots law, the person entitled to succeed to heritable property where there are no lawful heirs to take up the succession

Ultor ('the avenger'), a title of Mars, the Roman god of war. Augustus built a temple to U. in the Roman

forum. Ultramarine, the name given to a substance of a fine blue colour, originally ob

lazuli. It is 1

by heating with kaolin, charcoal, and sulphur, at nrst with exclusion of air. The dull green product is converted into the blue compound by heating with a supplier with a coss of air. The U. is made ready to use by washing and levigating. It is stable to light and warrior, as a man of acuteness, and first with exclusion of air. The dull

but its exact constitution is not clear. It is used as a pigment for colouring papers and in laundry work.

Ultramontane (' beyond the mountains, i.e. the Alps), a term applied to Italy by countries N. of the Alps and transferred to the Italian party in the Roman Catholic Church, who attach .

great weight to papal supremacy. Ultra Vires (Lat. beyond one's strength or power'), a legal phrase used particularly with regard to the limitation of the legal or constitutional powers of a person, court, company, or corporation. In company law anything done by a company outside the powers given in the Memorandum of Association (see COMPANY) is U. V. and void; nor can the com-pany make it valid, even if every member assents to it, because the rule is framed for the protection of future shareholders and the public at large, who may have dealings with the company. Acts, however, beyond the powers of the directors only may be ratified by the sharcholders, and acts U. V. the Articles of Association can be indirectly cured by simply altering the articles in the proper

manner. Ulugh-beg (1394-1449), a Tartar prince and a transport, transport of Timur-ber prince and a transport, transport of Timur-ber prince of Timur-ber prince of Standard on the imperial through of Standard on the death of all there is 1447. Its son rebelled against him on account of the unjust suspicion with which he had been treated, and U. was put to death. U. is remembered chiefly as death. U. is remembered chiefly as the founder of the observatory at

Samerkand.

Ulundi, a vil. in Zululand, Natal, the scene of several battles between the Zulus and the British. U. was the royal kraal of the Zulu kings.

Ulverston, a market in. of Lancashire, England, in the Furness, is 22 m. N.E. of Barrow-in-Furness; is connected by a ship-canal with the estuary of the Leven, and has a large export trade. Pop. (1911) 9552.

Hlysses, Illivse, or Illivse the

Ulysses, Ulyxes, or Ulixes, the name under which the Greek hero, Odysseus, was known among the U., who is the hero of Romans. Homer's Odysser, was the son of Lacrtes and Anticleia (or, according to later tradition, of Sisyphus and Anticleia), King of Ithaca, husband of Penelope, and father of Tele-machus. The story of U., as related

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telligence, in wisdom equal to the gods themselves, and in adversity courageous. Later poets sometimes represent him in a different light, as cunning, false, and mean. When the Greek chiefs had resolved upon their expedition against Troy, Agamemnon prevailed upon U. to join them, but it was with great difficulty he was induced to assist in the enterprise. During the war against Troy he acted a prominent part, some-times as a gallant warrior and sometimes as a bold and cunning spy. Some say he devised the stratagem of the wooden horse. After the destruction of the city his wanderings and sufferings began, which form the interesting story of the Odyssey.

interesting story of the Odyssey.

Ulzen, or Uelzen, a tn. of Hanover, Prussia, 20 m. S.S.E. of Luneberg. It has flax, sugar, tobacco, and machinery manufs. Pop. 10,422.

Uma, or Pārvatī, in Hindu mythology, the consort of Siva. She is also known as Kāti (the black one).

Durgā (the inaccessible), and Maha-devi, and her worship is widespread.

Uman, a tn. in the gov. of Kiev, S.W. Russia, 120 m. S. of Kiev city; has a horticultural college, and a trade in corn, spirits, beer, tobacco, leather, and iron goods. It was long held as a fort by the Cossacks of Ukraine. Pop. 30,000.

Umarkot, Omercote, or Amercote, a tn. of Sind, India, on the banks of the Narra. It exports the produce of the desert, and the inhabitants are

chiefly Raiputs.

Umballa, or Ambala, a city, cap. of Umballa dist., Punjab, India, 39 m. S. of Kalka; is an important railway junction and military cantonment. Pop. 80,000. The district has an Pop. 80,000. The district has an area of 1851 sq. m. and a pop. of

820,000.

Umbel, the term applied to the form of inflorescence common to plants of the order Umbelliferæ. In the simple U. the pedicels spring from the same point of the peduncle and the flowers are on one level, c.g. cowslip; and in the compound U. the axis branches in an umbellate fashion and each branch bears a simple U., c.g. hemlook.

c.g. hemlock. Umbelliferæ, an important widespread family of Dicotyledons, contains about 1600 species. flowers are characterised by their five free sepals and petals (often minute). five free stamens, and the inferior bilocular ovary formed from two carpels. Some of the chief genera are Carum, Eryngium, Apium, Daucus,

and Cicuta.

Umber, a natural pigment, con-

always ready to devise means of taining hydrated oxides of iron and avoiding or escaping from diffimanganese. The earthy pigment is culties, as superior to all men in inmanganese. The earthy pigment is washed and dried at 212° F. It then constitutes 'raw umber' which, constitutes 'raw umber' which, calcined, becomes a rich brown colour—'burnt umber.'

Umbilical Cord, see FORTUS.

Umbrella (Lat. umbra, shade), a portable protection from the sun or rain, is of great antiquity. was known in China as early as the 11th century B.C., and ancient soulp-tures of it have been discovered in Nineveh, Persepolis, and Thebes (Egypt). In the East the U. was an emblem of rank. In ancient Greece and Rome Us. were regarded as esseminate and seldom used by men, but in the 12th century the Doge of Venice had an U. with the ceremonial significance of a canopy. In English literature reference is made to the U. by Drayton (1620), Swift (City Showers, 1710), and Gay (Trivia, 1716). In the reign of Anne it was 1716). In the reign of Anne it was only used by women, the first man to carry it being Jonas Hanway (1712-86), a Persian explorer. The manufacture of Us. is chiefly carried on in London, Glasgow, Manchester, Paris, and Lyons. They are made of a framework of steel ribs, covered with silk, cotton, alpaca, or gingham, and supported by a wooden or metal stick.

Umbrella Bird, or Cephalopterus ornatus, a species of Cottingidæ. which is peculiar on account of a large umbrella-shaped crest on its head. The bird itself is of a uniform

black plumage.

Umbrella Tree, the name given for an obvious reason to many plants, notably to Magnolia Fraseri, Paritium Guineense, and a species of

Umbrette and Hammer-head are names applied to Scopus umbretta, a species of the family Ardeidæ, to which the herons belong. The bird dwells in the woods of Madagascar near pools and rivers, and feeds an small animals.

Umbria, an ancient div. of Italy, lying between Etruria on the W., the Sabine territory on the S., Picenum on the E., and the Ager Gallicus on the N. The original territory of the Umbrians was continually plundered omorians was continually plundered in the 6th century B.c. by Gallic and Etruscan invaders, until they were restricted to the upland tracts of the Apennines. They joined the Samiltes against Rome, but were subdued at Narnia (295). See Bücheler's Umbrica, 1883, and Hutton's Cities of Umbric 1905. of Umbria, 1905.

Umea, a scaport of Westerbotten, Sweden, near the mouth of the Umeä R., in the Gulf of Bothnia, 95 m. N.E. of Hernösand, Pop. 5859.

Umpire, see ARBITRATION CRICKET.

Umrer, a tn. of Nagpur dist., Central Provinces, India, 25 m. S.E. of Nagpur. It manufs. cotton-cloth. Pop. 16,000.

Umritsar, see AMRITSAR. Umtali, a tn. on the E. border of uthern Rhodesia. It has railway works and is a centre of the gold trade. Pop. 840 whites.

Unalaska, see ALEUTIAN ISLAND. Unao, a tn. and dist. in the Luck-now div. of the Central Provinces, India. The town is 10 m. N.E. of Cawnpore, and has a population of 13,500. The district has an area of 1737 sq. m. and a pop. of 1,000,000.

Unclaimed Dividends. By the Joint Stock Companies Winding-up Rules, where the liquidator has moneys representing dividends which have been unclaimed or undistributed for six months after the date of receipt, he must pay them into the Bank of England to the Companies Liquidation Account; after which any person claiming to be entitled must obtain a certificate of his title from the liquida-tor, and apply to the Board of Trade for payment. By section 52 of the National Debt Act, 1870, unclaimed government stock, including therein is transferred to dividends. National Debt Commissioners, and in the books of the Bank of England and the Bank of Ireland are entered the names and residences of the persons who held such stock prior to the trans-This list is open to inspection by any person who can show ground for claiming. If he establishes his claim claiming. he may have the stock retransferred to him, together with the amount of unpaid dividends in cash, without in-terest; but he has no title to any accumulations arising from the investment of such stock.

Where an over-Unconformity. lying series of rocks rests upon the eroded edges of an older series, usually having a different dip, the beds are said to be unconformable,

and the appearance is termed U. Unconsciousness, the condition in which no perceptions are made. it is difficult to define consciousness, so is it difficult to define its opposite, but in common speech the state of U. implies a suspension of the ordinary mental phenomena of consciousness; the mind is a blank for the time being, as in sleep, coma, fainting, etc. The immediate cause of U. is a disturbcirculation. ance of the cerebral either by congestion, as in coma, diminution of blood, as in syncope, or poisoning, as during amesthesia, etc. Normal individuals become habitually unconscious periodically

and, well established that the brain is more or less drained of blood during sleep, but the exact manner in which the mechanism works is not yet known. It is certain, however, that cessation of activity is essential for the wellbeing of the higher nervous centres. and although the limbs and other parts are normally quiescent during sleep, the state of U. is necessary primarily for the recuperation of the specific nervous agencies. doubtful if we can speak of any state of U. as complete; even the blankest of mental states appears to be a mental state, while there are gradations running from a sound sleep through dreamy conditions to the most alert state of general attention that we are capable of. Even intensity of attention is accordant. tensity of attention is accompanied by a withdrawal of attention from subjects away from the focus of consciousness, so that a person may be said, even when most determinedly awake, to be 'unconscious' of many things. See HYPNOTISM.

Unction, see EXTREME UNCTION,
Undercliff, The, a succession of
cliffs and terraces sloping towards the
sea on the S. coast of the Isle of
Wight, and extending from Dunnose
past Ventnor to Blackgang Chino, which seem to have been formed by landslips. The district extends for about 7 m., and is from 1 m. to 1 m. in width.

Underground Dwellings are distinguished from cave, mound, or rock dwellings in being excavated and strengthened inside. They are pre-historic and belong originally to the stone age, though probably con-tinued in use to much later times. In folk-lore they are associated with fairies, dwarfs, etc., the evidence pointing to habitation by conquered aboriginals of small stature, distribution from China, Korea, and Japan, along the northern stretch of the Old World to Scandinavia; their presence in Iceland, Greenland, N. America, and the Alcutian Isles, in all of which places they are yet found in use; and their occurrence in a belt

e rigor-· north-They

occur in many forms, gradually passing into that of mound dwellings (q.v.). In Scotland they are numerous in the upper valley of the R. Don, being known as *crd-houses*, *Picts'* houses, or weems, and evidently form. ing villages. They are supported by masonry of the simple, massive, Cyclopean kind, with no mortar, carvings, inscriptions, or marks of tools. The cave of Raitts in Inverby the phenomenon of sleep. It is ness-shire has the form of a horseabout 70 ft. long, 8 ft. broad, and 7 ft. high. The side walls converge upwards and are covered with large slabs. At Pitcur, in Forfarshire, the length of an U. D. is nearly 70 yds., entered by means of ladders or notched poles, but could hardly have been intended for defence. They may have been used in remote and understanding desired places as normal residences, or probably more often as places of concealment to which the inhabitants might retire when threatened by attack.

Underground Railroad. system formed in the Northern States of America before the Civil War in order to assist fugitive slaves to reach Canada, where they were safe from recapture. Guidance, shelter, food, and clothing were provided by the

sympathisers.

Underground Railway, see LONDON

-Traffic.

Under-sheriff, see SHERIFF.

Understanding, in philosophy, term used in two somewhat different senses. By the older English philosophical writers, such as Locke and Hume, it is used to denote the human mind in general, and the human intellect in particular, in opposition to the faculties of emotion and volition. It is now more used in the sense given it by Kant and developed by Hegel. In this sense U, is the lower faculty of the mind which deals with phenomena, while reason is the higher faculty dealing with noumena or universals.

Universals.

Underwood. In law, saleable U., as opposed to timber trees intended for permanent growth, may be defined as 'woods consisting of oak, ash, or elm, which are universally timber trees, or of beech, which may be timber by custom, or willow, the stools of which can be and are so treated as to produce a succession of saleable crops.' In less judicial lan-guage U. is small trees or shrubs growing amongst larger trees. A tenant for life or for a term of years is entitled to cut and make use of U., if ripe for cutting, but may be restrained from improper cutting or from cutting from saplings.

Underwriter, see INSURANCE. Undeveloped Land Duty, see LAND

TAXES.

Undines, the name given in the fanciful system of the Paracelsists to the elementary spirits of the water. They are of the female sex. Among all the different orders of elemental spirits they intermarry most readily

shoe with one limb truncated, and is to wife must be careful not to go on the water with her, or at least not to anger her while there, for in that case she will return to her original element. Baron de la Motte Fouqué has made this Paracelsist fancy the basis of an exquisite tale, entitled *Undine*. Undue Influence. In law, a con-

Undue Influence. In law, a contract to which a party has been induced to give his consent by the exercise of U. I. on the part of another is voidable. So also a will can be attacked by interested parties on the same ground. Presumptions of U. I. arise generally in connection with gifts. It is entirely a question of fact whether in any particular case U. I. was used. The law will not pre-sume U. I. until it is first proved that the relationship between the parties was or is such that one of them was likely to be able to exercise his influence over the other, and then it is open to the defendant to rebut the inference from such relationship. The. relations of solicitor and client. parent and child, guardian and ward, trustee and beneficiary are all pre-sumed to give the former, in each case, influence over the latter. But the strength of the presumption depends entirely on the intimacy of the relationship, e.g. that of a doctor and his patient is in most cases not nearly so close as that of a guardian and ward. U. I. is not in any way a doctrine specially connected with defective will power, though such fact, if present, may be a strong element for the consideration of a judge or iury.

Undulatory Theory, see FERENCE, LIGHT, OPTICS, etc. INTER-

Unearned Increment, see INCRE-

MENT, UNEARNED. Unemployment. It is only within recent years that anything like a scientific attempt has been made by the state to grapple with the pro-blem of U. So far as skilled labour is concerned, the removal in the course of the last century of most legislative restrictions on trades unions left those institutions free to go beyond their primary purpose of providing benefits to distressed members and to organise specialised classes of labour in such a way as to mitigate the evils of U. in such classes. From the reign of Queen Elizabeth, when the vagrant or vagabond class had increased so as to require legislative attention, the only remedy the state had to offer was the Poor Law system, and in extending out-door relief the policy of the Poor Law ignored all distinctions between the destitute through trade with human beings, and the U. who depression and the congenital loafer gives birth to a child under such a or 'unemployable.' The recognition union receives with her babe a human of the differences between the class soul. But the man who takes an U. of unemployed who are of good

character and can show good in-dustrial records, the aged, infirm, or inefficient unemployed, and the morally defective unemployed, has at least resulted in an endeavour to meet these different classes with different remedies. Most modern re-the seasonal trades, especially the medies are, for the most part, and building trade, and the same writer indeed necessarily, counteractive suggests that the effects of periodic rather than constructive. Positive failure may be counteracted by rather than constructive. Positive ramedies, as, for instance, the provision of work on afforestation or land reclamation schemes, have often been suggested but never seriously trade cycle, but it is difficult to see put into practice; such schemes do not supply the need of permanent skilled work for the skilled unemployed, and it would not be difficult to show that

· FLUCTUATIONS IN EMPLOYMENT—PERCENTAGE UNEMPLOYED IN TRADES UNIONS (1901-12)

(From the Sixteenth Abstract of Labour Statistics of the United Kingdom)

	General Percentage for all Unions in- cluded in Returns	MEAN ANNUAL PERCENTAGE returned as Unemployed in						
Year		Engineering, Ship- building, and Metal	Building	Wood- working & Furnishing	Printing and Book- binding	All other trades in- cluded in the Returns		
1901 1902 1903 1904 1905 1906 1907 1908 1909 1910 1911	3·3 4·7 6·0 5·6 3·7 7·8 7·7 4·7 3·0 3·2	3.85 6.64 8.61 4.19 12.5 13.0 6.84 6.3.6	3·9 4·4 7·3 6·9 7·3 11·7 8·3 4·2 3·7	3.7 4.7 6.8 5.8 4.6 8.3 7.6 8.3 7.6 3.3	4.7 4.7 4.7 5.5 4.5 5.6 4.5 5.6 4.5 5.2	2·1 1·9 2·5 3·0 1·9 1·9 2·6 2·6 2·1 2·1		

with the cyclical trade movements, supply of more or less unremunerative

a policy of creating work by the state labour. The principal modern means can have little better economic results than the direct pecuniary dole. From in England, are: (1) Labour Exstatistics supplied by metropolitan change grow out statistics supplied by metropolitan distress committees under the Unemployed Workmen Act. 1995, it local the unemployed are skilled workers, and though in drawing inferences ment offices. French public labour exform such an estimate it is of vital importance to take into account those whom chronic U. has rendered virtually unfit or unskilled, it is reasonable to assume that the state is suited to his abilities far more quickly justified in focussing its attention mainly on the problem of the casual unemployed class and in formulating schemes for decasualising such labour. Professor Chapman (in Palgrave's Dictionary of Political Dictionary of Political points out the undeniable fluctuations in employmen and exist rather to trade unionists are 'closely correlated casualise unskilled labour by

- here that they are mostly e of penal or reformatory and exist rather to dework than to give work to the fit (see cantons inaugurated compulsory also Borstal; Prevention of schemes, though with very varying Crime). (3) Insurance. Compulsory degrees, of success. In France and voluntary state insurance against attempts have been made to work a U. is the latest remedy in English system of subsidisation under state industrial history. But a compuldirection of trade union unemployed sory insurance scheme had existed insurance, but Professor Chapman

NUMBER OF UNEMPLOYMENT BOOKS ISSUED UNDER THE NATIONAL INSUR-ANCE ACT UP TO JULY 12. 1913.

(From the Sixteenth Abstract of Labour Statistics of the United Kingdom)

Occupation	Building and Construc- tion of Works	Ship- building	Engin- eering and Iron- founding	Con- struction of Vehicles	milling	Other insured work- people	Total
Bricklayers Masons Carpenters Plumbers Plasterers Painters Sawyers,etc. Navvies and Contractors' Labourers Platers, Riveters,	79,319 48,809 150,629 44,414 24,523 153,939 6,393	129 13,871 3,047 5,880 1,390	1,832 30 10,118 2,808 6,200 2,723	564		3,622 2,386 10,762 2,117 147 2,087	84,928 51,225 191,561 52,950 24,670 185,794 22,406
	150,638		124	· _	_	-	150,762
and Boiler- makers Shipwrights Pattern-	3,430 26	53,801 31,189	41,601	,	_	1,454	31,215
makers Moulders	314	971	14,343	442		224	16,294
(Metal) Smiths Erectors,	72 3,906	1,003 5,000	87,787 27,928	1,559 10,492	70	1,306 7,903	91,727 55,299
Turners, Fitters Metal Ma- chinists Wiremen, Electricians Cycle Makers Motor Chas-	7,425	12,497	240,721	33,261	330	25,338	319,572
	771	2,634	71,079	16,899		1,306	92,689
	5,672	1,988	19,219	1,023 14,775	_	2,690	30,592 14,775
sis Makers Coach-	-		-	6,923	_	! —	6,923
makers Cabinet-			<u> </u>	44,299		605	44,904
makers Other skilled	4,724	2,380	602	5,638	93	¦	13,437
Workers Labourers.	15,697	3,847	32,279	4,639	129	903	57,494
etc.	346,967	134,601	306,169	47,283	8,292	23,484	866,796
	1,047,668	274,228	865,563	216,028	19,118	86,334	2,508,939

for some years in Germany prior to points out two vital defects in this the passing of the National In-system: (1) The state subsidies would surance Act of 1911 in England. A probably be used to support strikes; voluntary system was tried in Cologne (2) it makes an invidious distinction and Leipzig over ten years ago, but between unionist labour and nonit was soon found that the amount unionist labour, with the result that expended on benefits far exceeded the latter would be almost bound to the revenue from contributions. Prostart independent schemes. As to fitting by this lesson some of the Swiss, the provisions of the National In-

SURANCE ACT.

Ungava, a former dist. of Labrador, Canada, occupying all the interior of the peninsula. Area 355,000 sq. m. It contains numerous lakes and is watered by many small rivers. It is now absorbed in Ontario, but the district is still unorganised. Fort Chimo is the chief port. Pop.

tomie und Physiolog. 1855, and Geologie i Waldbaume, 1869.

Unger, Joseph (b. 1828), an Austrian jurist and statesman, born and educated in Vienna, and became professor of jurisprudence in the university there in 1857. He entered politics in 1867 and held several important posts. His chief work is System des Oesterreichischen Allgem-

system the description of the second region and Pachydermata of Cuvier. feet are never plantigrade and the toes are never clawed, and number more than four only in the elephants

(Proboscidea).

Ungvar, a tn., cap. of co. Ungvar, N.E. Hungary, on the Ung, 80 m. N.N.E. of Debreczin. It is a see of the Greek Church. There is a mineral spring and a trade in wine and timber.

Pop. 15,000.

Uniats, those communities of E. Christians which acknowledge the supremacy of the Pope and are not required by him to accept certain of the W. disciplinary regulations. general, they use their own liturgy in their own tongue, use leavened bread, and have a married clergy. They governed by special papal decrees. They are

Unicorn (Lat. unus, one; cornus, horn), a fabulous animal referred to by Greek and Latin writers. It was said to be a native of India, resembling a horse in shape and size, and having one straight horn 11 oubits long on its forehead. It was very swift. The figure is used in

ounts long on its literatu. It was very swift. The figure is used in heraldry.
Unich, Unije, or Unico, a maritime tn. of Trebizond, Asia Minor, on Black Sea, 50 m. S.E. of Samsun.
Pop. about 10,000.
Uniform: MILITARY. — Originally, relies to figure the green yearly raised.

since regiments were usually raised almost as mercenary bands through the colonel of the regiment, the garb of the units of that regiment was decided by its commanding officer. No

surance Act, 1911, relative to U. regularity was observed, and the insurance, see under NATIONAL IN- choice of garb depended entirely upon choice of garb depended entirely upon the taste of the officer commanding. The regiments raised for the service of the king were naturally the livery of the king; this was scarlet, and so in the course of time all regiments came to wear a scarlet livery and to determine their origin only by a differentiation of the facings which they were, Chimo is the chief port. Pop. Such facings being generally the colour of the livery of the officer who raised them. The royal regiments, botanist and geologist, born in Styria. He was appointed professor of botany at Gratz (1836) and at Vienna (1850). He such facings being generally

more closely to one another atter of U. Hence we find he Stuart and Georgian atter of U. during the periods great changes being made in such direction, so that it became possible to call the costume of each regi-ment a U. The original Stuart cavalier hat passed first of all into the three-cornered hat that distinguished Marlborough's troops, and next into Mathorough s croops, and hear has the cocked hat of the middle Georgian period. During the whole of this period the soldiers were the knee breeches which for so long were the usual dress of the civilian. The short coat which for so long was universal in all branches of the service was replaced by the tunic in all regiments save the Highland and the Royal Artillery. The unserviceability of the Artillery. The unserviceability of the army clothes was shown drastically during the Crimean War, and the Mutiny again proved that these should be replaced by something lighter and more serviceable for solutions. diers on foreign service. During the S. African War the troops were clad in khaki, and this has been now adopted as the service dress of all, or practically all, troops. Some of our troops have borrowed the models of their dress from abroad. The hussars have the Hungarian dress, and wear a busby which has now developed into a hugo fur-covered hat with a strip of cloth stitched to the side. The lancers wear the U. of the Polish Uhlans, on the model of which they are founded. The cuirass was adopted by the dragoons and the household cavalry. The infantry head-dress has undergone many changes: the cocked hat gave place to the shake, and this, in the course of time, to the cloth, spiked helmet which is worn to-day. Towards the end of last century all royal regiments were blue facings, all non-royal regiments white facings if English or Welsh, yellow if Scottish, and green if Irish. Now, however, this has been altered, and the regiments wear the facings which they held previous to 1881.

Military Badges.—These denote

collar, or sleeve, and in the case of non-commissioned men proficiency in some special branch, and are then worn on the sleeve. Officers' badges are: one star, second-lieutenant; two stars, lieutenant; three stars, captain; crown, major; lieutenant-colonel, crown and one star; colonel, crown and two stars; brigadier-general, sword and baton; major-general, sword and baton and one star; lieutenant-general, sword and baton, crown and two stars; general, sword and baton, crown and three stars; field-marshal, crossed batons in a Profiwreath of laurel and crown. badges are denoted by: ciency colours, colour - sergeant; crossed crossed axes, pioneer; spur, farrier;

signaller, crossed flags; marksman, crossed rifles; wheelwright, a wheel.

NAVAL.—No uniformity of dress can be said to have appeared in the navy until about the year 1660. The Tudor livery of green was worn during the Tudor period and replaced by a scarlet livery under the Stuarts. The first attempt to obtain any uniformity was due to the official designation of the clothes which were stocked in the slop chest. In the 17th and 18th centuries the seamen wore usually kilt, trousers, a pea-jacket, and small cocked hat. These cocked hats were replaced by soft hats towards the end of the 18th century, and about the same time an attempt was made to introduce a U. for officers. The sailor collar which is worn at the present time dates its origin from the time when sailors wore 'pigtails,' and were worn to prevent the hair soiling the uniform. During the revolutionary wars sailors wore a blue jacket and white trousers. By the middle of the 19th century both officers' and men's Us, were fixed very much as they are at the present time. The present monkey jacket replaced the blue tunic about 1889. A white uniform is worn in the tropics. Naval Badges.—The term badge is

applied in the navy only to the dis-tinctive signs worn by the men and boys. The distinctive marks of the varying grades of officers are not techcalled badges, although the nically term is often commonly applied. Naval badges are worn as signs of good conduct, special qualifications, and rank. A first-class petty officer wears crossed anchors surmounted by a crown; a second-class petty officer, an anchor surmounted by a crown; a chief scaman, an anchor. On the left arm good-conduct badges are worn. Badges denoting special qualifica-tions are worn on the right arm; chief among them are:

rank in the case of officers, and are crossed flags; a marksman, usually then worn either on the shoulder, crossed rifles; a stoker, a propeller; armourers, a gun and crossed axe and hammer; blacksmiths and wheelwrights, crossed axe and hammer; a torpedo-man, a crossed gun and tor-pedo. Chief petty officers are known by the distinctive buttons which they wear, as also are engineer artificers. Uniformation, see CATACHYSMAL

ACTION. Uniformity, Acts of, a series of Acts passed by parliament for the regularising of public worship in England. The Act of 1559 imposed the Prayer Book on the whole kingdom, and required all persons to attend their parish church. The best-known Act. however, is that of 1662. This required the new Prayer Book to be used in all churches and places of worship throughout the kingdom. For their refusal to conform to this regulation, a large number of ministers who had been inducted into benefices during the commonwealth period were compelled to give up their posts. The 1872 Act authorised certain The shortened forms of services and made

provision for special services.
Union: 1. The cap. of Union co.,
S. Carolina, U.S.A., 70 m. N.W. of Carolina, U.S.A., 70 m. N.W. Ol Columbia, with cotton mills. Pop. (1910) 5623. 2. A tn. of Hudson co., New Jersey, U.S.A., on Hudson R., opposite New York. Pop. (1910) 21,023. Union, or Tokelau, a group of islets

in the Pacific, situated between lat. 8° 30° and 11° S., and long. 171° and 172° W., 350 m. N.E. of Samoa. The principal are Faksafo, Nukunono. Nassau, Atafu, and they belong to Britain, being included in the Gilbert and Ellice Isles. Copra is the chief product. Area 7 sq. m. Pop. 1000. Union, or Workhouse, see Poor

LAWS.

Union-Castle Steamship Line was formed by the amalgamation of the Union (founded 1853) and the Cistle (founded 1872) Lines in 1900. Union Line from 1857 carried on a mail and passenger service from Southampton to the Cape and Natal, fromand at the time of its amalgamation had a fleet of twenty-three vessels. The Castle Line from 1872 shared the government's mail contract with the Union Line, starting from London instead of Southampton; in 1900 it had a fleet of twenty vessels. There is now a fleet of forty-four vessels, with a gross tonnage of 319,360. The Edinburgh Castle, built 1910, has a tonnage of 13,326.

Unionidæ, a family of eulamelli-branchiate molluscs, is represented by various living species in the fresh ight arm; chief water of Africa, America, and other a signalman, parts of the world. The genus Margarilana contains the river pearl- day is still the creation of an Irish mussels.

Union (Irish). The U. of Great Britain and Ireland was effected on Jan. 1, 1801, after being rejected by the Irish Commons the previous year by only one vote. The 'bigoted fury of Irish Protestants,' the attitude of the Irish Parliament during the dis-putes over the regency, and the fact that it was only by 'hard bribery' that the English government could secure their co-operation the simplest measures of administration, all conspired to convince Pitt at the end of the 18th century of the absolute political necessity for U. There can be no doubt that the Act of Union was passed contrary to the wishes of the whole Catholic population of Ireland: but this was prior to the days of electoral reform, and the representatives of the Irish people, such as they were at that time in the Irish Parliament, were eventually in-duced by a liberal and shameless distribution of pensions and peerages to withdraw their opposition to the Bill. The Act provided that one hundred Irish members should become part of the House of Commons at Westminster, and twenty-eight temporal with four spiritual peers, co-opted for each, Parliament by their fellow peers, should represent Ireland in the House of Lords. Commerce between the two countries was to be free from all restrictions, and the trading privileges of each were to be freely extended to the other, while there was to be a propor-tional distribution of the burden of taxation between the two nations. The English Parliament, however, reckoned without its host in the shape of agrarian discontent and poverty, not to mention the rankling sense of injustice that has lurked in the bosom of Irish Catholics ever since the earliest days of the English settle-ments; and the 'Irish question' has never ceased to be the great thorn in the side of every British government of modern times. Some measure of tranquillity was restored to Ireland in 1870 when an Act was passed to improve the position of the Irish tenants, and again in 1881 when the Gladstone government of that year gave tenants the right to sell or transfer their right of tenure, to demand that rents should be fixed, and that leases should be renewed for a definite period. None of these or later land reforms, however, have satisfied the Irish people, and peace of an ambiguous nature has only been preserved by

Parliament to sit in Dublin, with

with the principle that the Irish executive should be responsible solely to the Irish Parliament. (The subiect of Home Rule and the main arguments for and against 'separation' will be found dealt with in the article so entitled.)

Unionist, see POLITICAL PARTIES. Union Jack, see FLAG.

Union Steamship Company of New Zealand was originally formed to carry on communication between the different ports of New Zealand and with Australasia. In 1875 the present company was formed, and extended its services to the Pacific, Canada, and India. There is a fleet of sixtythree steamers with a total tonnage of 158,000. The largest vessel is the Uakura (8075 tons).

Uniontown, a bor. of Pennsylvania, U.S.A., and the cap. of Fayette co., 44 m. S.S.E. of Pittsburg. Among the industries are glass-blowing and iron founding. Pop. (1910) 13,344.

Union University, Schenectady, New York, was founded in 1795 as a non-contrain central of higher education.

sectarian centre of higher education by representatives of various denominations. It owes its growth and development very largely to the energetic and enlightened policy of Dr. E. Nott, who was its president for over fifty years. In 1913 it had 769 students on its books with 123 interpretations. instructors.

Unit, see Units.
The term, in its strict and literal sense, denotes simply belief in one God, and when thus understood is a generic term applicable not only to Christianity but also to Judaism, Mohammedanism, and even to Deism. But it has now almost entirely lost this general sense. and is almost invariably used as the designation of the belief held by certain Protestants who, while rejecting the whole scheme of orthodox theology, have yet some kind of belief in the pre-eminent position of Jesus Christ in the world's history. This definition is somewhat vague, but the necessity for vagueness will be seen when we remember that certain Unitarians have shown such a zeal against dogmatism and definition as to object to the term Unitarian itself. No confession of faith has over been people, and peace of an ambiguous nature has only been preserved by issued by a Unitarian body, and it is such coercive measures as the Irish Crimes Act of 1892, passed by the Conservative Government under Lord Unitarians deny the divinity of Jesus Salisbury. The 'irreducible mini-Christ, the doctrines of original sin, mum' of Irish demands at the present the atonement, and eternal punish-

ment held by the Evangelical brought about risings in the N. of churches. Unitarians lay great stress Ireland in 1797 and 1798, marked by on the Fatherhood of God and on the bloody atrocities. Help was expected universal brotherhood of men. They from France, but none came, and the have always treated the Bible in a rebellion was subdued. See Madden's have always treated the Bible in a rebellion was subdued. See Madden's rationalistic manner, and most modern The United Irishmen, 1858. Unitarians would regard its inspiration as differing only in degree and (formerly called the North-Western not in kind from that of other great Provinces and Oudh), in British India, literature. The English Unitarians is situated in the valley of the Upper trace their descent from those Pressidated in the valley of the Upper trace their descent from those Pressidated in the valley of the Upper trace their descent from those Pressidated in the valley of the Upper trace their descent from those Pressidated in the valley of the Upper trace their descent from those Pressidated in the valley of the Upper trace their descent from those Pressidated in the valley of the Upper trace their descent from those Pressidated in the valley of the Upper trace their descent from those Pressidated in the valley of the Upper trace their descent from those Pressidated in the valley of the Upper trace their descent from those Pressidated in the valley of the Upper trace their descent from those Pressidated in the valley of the Upper trace their descent from those Pressidated in the valley of the Upper trace their descent from those Pressidated in the valley of the Upper trace their descent from those Pressidated in the valley of the Upper trace their descent from those Pressidated in the valley of the Upper trace their descent from those Pressidated in the valley of the Upper trace their descent from those Pressidated in the valley of the Upper trace their descent from those Pressidated in the valley of the Upper trace their descent from the Valley of the Upper trace their descent from the Valley of the Upper trace their descent from the Valley of the Upper trace their descent from the Valley of the Upper trace their descent from the Valley of the Upper trace their descent from the Valley of the Valley The name Presbyterian is still largely retained. Many of the American congregationalists are also Unitarian in belief. A comparison of Unitarianism with Arianism and Socinianism may be made by reference to the articles on these subjects. Unitarianism still on these subjects. Untertaining still flourishes most in the districts which embraced it at the time of the Socini, and especially in Transylvania. In this country, during the reigns of Edward VI., Elizabeth, and James I., a more stable orgathment of the Lindsay, who had seeded irom the Established Church in the preceding year. Unitarians, however, continued to suffer under various civil disabilities until 1813, when the last of these were removed. See J. H. Allen, Historical Sketch of the Unitarian Belief, 1884; and Modern Unitariansm, 1886; and the writings of W. E. Channing, J. Priestley, J. Martineau, and others.

United Free Church of Scotland. Scottish Presbyterian body, for in 1900 by the union of the unio

Ings of W. E. Channing, J. Prieste, J. Martineau, and others.

United Free Church of Scotland, a literature. The museum (entrance Scottish Presbyterian body, formed in 1900 by the union of the United Presbyterian Church and the Free Church of Scotland (q.v.). This union was the result of a long series of negotiations prompted by a strong British Meteorological Office. The and general desire for reunion. To official recording of weather commenced in 1870 under the Secretary menced in 1870 under the Secretary in 1890 a bureau was

antipathy to everything English. It army medical staff. In 1847

is mostly plain land, watered by the Ganges and the Ramour. To the N. a sour of the Himalayas encloses the border of the province. The climate is bot and rather unhealthy. rice, barley, millet, maize, and sugarcane are grown in considerable quantities. The principal manufactures are cotton, leather, opium, sugar, and indigo. The United Provinces is governed by a acting under th

bring it about it was necessary to act menced in 1870 under the Secretary contrary to the title deeds of the Free Church, and the small body who established under the Department of refused to take part in this act (the Agriculture with headquarters in 'Wee Frees') successfully sub-Washington and stations all over the stantiated their claim to the property U.S.A. The duties are primarily the of the Church.

United Irishmen, a league founded 'forecasting'; these are, in the States, and the states are properties of the contraction of the cont of the Church.

United Irishmen, a league founded in 1791 by Theobald Wolfe Tone, in 1791 by T

Smithsonian Institution, in 1869 the Canada. The Rocky Mts. are not a Cincinnati Observatory, commenced extended meteorological work. The true co-ordination of these efforts was finally brought about by the establishment of the Weather Bureau, and the publication of its reports.

United States of America: Geo-graphical position and boundaries.— The U. S. lie roughly between 25° N. and 49° N. lat., and 69° W. and 125° W. long. The boundaries are the Atlantic Ocean on the E., the Gulf of Mexico and Mexico on the S., the Pacific Ocean on the W., and the Dominion of Canada on the N.

Surface.—The surface of the U. S. from E. to W. may be divided as follows: (1) The Atlantic Plain, which extends from the coast to the Alleghany Mts. (2) The Mississippi Valley and Great Central Plain, which extends from the Alleghany Mts. which extends from the Alleghau, Mts. W. to the Rocky Mts. (3) The Western Highlands. (4) The Pacific Slope, which extends from the Rocky Mts. to the Pacific Ocean.

Mountains.-The chief mountain systems are the Appalachian region in the E. and the Rocky Mts. in the W.

1. The Appalachian system consists of very ancient rocks, which were elevated in former ages to a great height, and then reduced by erosive forces to a broad lowland. More recent elevation is responsible for some of the present ranges, while others are remainders of the earlier movements which have resisted erosive forces. The surface of this region to-day is a series of parallel ranges divided by fertile valleys. The various ridges are named as follows: the Blue Ridge, which lies nearest the Atlantic; the Kittatinny Chain; the Alleghany Mts., which lie in the western part of Virginia and the cenwestern part of Virginia and the central part of Pennsylvania; the Cumberland Mts., on the eastern boundary of Tennessee and Kentucky; the Catskill Mts., in the state of New York, which are continued in the Sacondago Chain; the Green Mts., in the state of Vermont; the Hudson River Highlands; and the hills of New Hampshire. There is no peak of marked elevation in the Appalachian region, the highest point being Mt. region, the highest point being Mt. Washington in New Hampshire, which reaches a height of nearly

7000 ft.

2. The Rocky Mt. system is composed of comparatively recent formations, and in some parts elevation still goes on. Many of the ranges are anticlinal, and many peaks rise to cast heights. Volcanoes and extinct volcanoes are numerous. The U.S. Rocky Mt. system extends from 29 N. to 49° N. lat., a distance of about 2000 m. The system is continued in

single range, but are double and sometimes threefold. These ranges are the edge of a region of plateaux and hills which extends to the coastal mountains. The chief mountain mountains. The chief mountain ranges belonging to the U.S. Rockies are the Bitter Root Mts., the Blue Mts., and the Big Horn Mts. in the N.; the Wahsatch Mts., the Wind River Mts., and the White Mts. in the centre; and the Sierra Madre and the Sangra de Cristo Range in the S. highest peaks are Mts. Harvard and Lincoln, both over 14,000 ft. In the western part of the southern Rockies lies the Great Basin of Colorado, with the Wahsatch Mts. on the E. and the Sierra Nevada on the W. This basin

sterra Nevnda on the W. This Jossin is extremely arid, has suffered much volcanic action, and is intersected by deep canons cut by the rivers.

The W. of the highland region of the Western U. S. is bounded by the Pacific Mts. These consist of three ranges, the Sierra Nevada, the Cascade Range, and the Coast Range. These are broken only by the rivers which cut their way through to the which cut their way through to the coast. The descent from the hills to

the coastal plain is very steep. Coast.—The E. coast of the U. S. continues the Continental Shelf of Canada. This shelf was at one period in the geological history of the country completely uncovered, and at another period the whole of the present coastal plain, as well as the present Continental Shelf, was sub-merged. The Continental Shelf practically disappears off Florida.

The river valleys which cross the coastal plain and the Continental Shelf are now partially submerged, and so give safe and deep harbours. From the northern boundary of the U. S., as far S. as Cape Hatteras, the coast is low and sandy, but these river mouths make good harbours. From Cape Hatteras to Cape Sable, however, the coast is swampy, and, especially in Florida, fringed with lagoons. The harbours of this part of the coast are not good naturally. The coast of the Gulf of Mexico is low and very swampy.

There is only one considerable in-dentation on the E. coast of the U.S.,

which runs direction for th an average

able indentation is San Francisco harbour, which is deep and safe.

Rivers.—The rivers of the Atlantic Plain rise in the Appalachian system. and are comparatively short. many cases they are too rapid to be of much value for navigation, but are valuable as supplying water power. These rivers almost without exception have good harbours at their mouths. The chief are: the Hudson, the Delaware, the Susquehanna, the Potomac, the James, and the Savannah. The Hudson is the most valuable for commerce, as it is connected by the Eric Canal with Buffalo and the Great Lakes, while the Richelicu Canal connects it with Montreal.

The Great Central Plain is drained by the Mississippi-Missouri river system, the basin of which covers half the area of the U.S., and is equal in area to about one-third the area of Europe. The Mississippi rises in Lake Itasca in Minnesota, at about 1500 ft. above sea-level. After flowing for about 100 m. in an easterly direction it turns S., and is joined by numerous tributaries. The chief are: St. Peter's R., which joins the main stream 9 m. above St. Anthony's Falls; the Mississippi just above St. Louis; the Ohio, which joins the main river at Cairo; the Arkansas, the Wisconsin, the Illinois, and the Red R. The whole course is about 4200 m.

The Mississippi-Missouri has made a broad flood plain, varying in width from 30 to 60 m. This plain is subject to sovere inundations, for it slopes very gently away from the river bod, which is in many parts of the river above the level of the surrounding plain. The river carries a vast amount of silt, which it deposits at its mouth, thus forming a delta which stretches a series of long narrow ten-

tacle-like arms seaward.

Other rivers falling into the Gulf of Mexico are the Mobile and the Rio Grande. The Mobile, which enters the gulf at the town of Mobile, is the union of the Alabama (600 m. long) and the Tombigbee. The Rio Grande (about 1100 m. long) forms the boundary between Toxas and Mexico.

The rivers flowing into the Pacific are comparatively short, owing to the nearness of the coast ranges to the sea. The Colorado R. flows into the Gulf of California, after crossing an arid plateau. It has cut for itself a deep cañon with almost perpendicular banks, in many places more than a mile high. This canon is over 200 m. long.
The San Joaquin and the Sacra-

mento rivers unite and flow into the harbour of San Francisco; these and the Columbia are the only important rivers on the W. of the U. S.

The Great Basin of California is largely an area of inland drainage. The rivers flow into lakes with no

outlets to the sea.

Lakes .-- Of the Great Lakes of N. America Lake Michigan lies within the U.S., and the southern shores of Lake Ontario, Lake Erie, Lake Huron, and Lake Superior are U.S. territory. These lakes were formed by the action of the glacier which once covered the continent as far S. as the forty-second parallel, roughly speak-ing. They are remainders of much larger lakes and are of the utmost importance as waterways. New England has very many smaller lakes which are also the result of glacial action. The largest lake of the U.S., apart from the Great Lakes, is the Great Salt Lake of Utah. The extremely low rainfall of this region and the intense evaporation consequent upon the high temperature are responsible for the salinity of the waters of the lake.

Natural wonders.—Of the great natural wonders the chief are the Niagara Falls, the Grand Canyon of Colorado, and Yellowstone Park.

Climate.—A country as large as the U.S. and one having so wide differences of elevation, must necessarily have a climate of wide differences of temperature and of rainfall.

Temperature.—In summer the hottest region of the U. S. is the Great Basin of California, which in July has an average temperature of over 90° F. The eastern coast has an average July temperature of between 70° and 80°, while the average July temperature of Florida, of the Gulf Coast, and of the more western part of the Central Plain, is between 80° and 90°. Owing to the tempering influence of the Pacific, the average July temperature of the W. coast is slightly lower. In winter the isotherms tend to run in almost parallel lines, curving slightly N. over the W. coast, and slightly S. over the Central Plain. The average January temperature of the extreme S. of Florida is 70°, that of the greater part of the W. 70°, that of the greater part of the W. coast is between 50° and 60°, while the greater part of the E. coast averages in January a temperature between 50° and 32°, the temperature gradually decreasing as we go N. This applies also to the Central Plain. The S.E. states, therefore, have almost a sub-tropical climate, without any extreme variation between the winter and summer temperatures. The eastern and central states are subject to much greater variations of temperature, while the western coast is less extreme in climate than are the other parts of the U.S. The rainfall is heaviest in Florida, in the Gulf

States, and on the E. coast; it gradually decreases towards the W.; Calialmost every kind of mineral. There fornia and Colorado are very dry, and are seven main coalfields in the U.S., the northern part of the W. an abundant rainfall. The higher the E. coast is steady at greater than that of England. The greater than that of England. The land is chiefly monsoonal in character, falling mainly in the summer. The winds from the Pacific bring rain to the W. coast, but the Sierra Navada three states produce iron in consider falling mainly in the summer. The winds from the Pacific bring rain to the W. coast, but the Sierra Nevada Mts. shut these winds off from the Great Basin of California, which has an average yearly rainfall of less than 10 in. The climate of the Central Plain is rendered colder in winter owing to there being no shelter from the winds blowing from the N. The Central Plain and the New England States have heavy snowfalls winter, while perpetual snow lies on

the summits of the Rockies and of

the Coast Ranges. Vegetation .- Great variety marks the vegetation of the U.S. In its natural state the eastern coastal plain and the eastern highlands were covered with temperate forests; the chief trees of these forests were the maple, the birch, the red pinc, the white pine, and the spruce. These have, of course, been largely cut down. The southern states (the Gulf States) have some sub-tropical forest trees, which yield woods valuable in commerce. The western coast forests are extensive, and are noted for the enormous size of some of their trees, which are mainly spruce, cedar, red-wood, and the Sequoia pine. The Central Plain was originally covered on the E. with mixed forest and grass lands, which merged into grass lands without forests to the W. as the rainfall decreased. This district is now the great wheat and grass area of the U.S. The Great Basin region has not much vegetation, what there is is mainly of a desert type, though where irrigation works have been successfully carried out this region has proved itself capable of supporting a luxuriant vegetation. Maize, potato, tomato, pumpkin, tobacco, were unknown in Europe until intro-Maize, duced from America.

the U.S. were once the haunt of the bison, but these are now almost exterminated, though herds are still preserved with sedulous care in the Yellowstone Park district. Other indigenous animals are the grizzly bear, which belongs to the Rockies, the opossum, the prairie dog, and various kinds of deer. The fish include cod, halibut, mackerol, shad, and salmon. Many varieties of fresh-water fish are fish, the trout, and the sturgeon.

Animals.-The Central Plains of

bituminous coal. These three states produce iron in considerthree states produce from in considerable quantities. The most productive iron mines are in the neighbourhood of Lake Superior; the most valuable mines apart from these are in the southern Appalachian region. The southern Appalachian region. The Lake Superior district is rich also in copper, which is found almost in its. pure state. The eastern states are rich also in petroleum and in natural gas. Pennsylvania is the largest producer of these commodities. Copper is found also in Montana, in Arizona, and in Michigan. The U.S. produces more than half the world's supply of copper. Zinc is found in Kansas and in Missouri. Gold is found in the western states, especially in Cali-fornia. It is found also in Alaska. Silver is found in Montana, Idaho, Washington, Orgon, Novada, and California. Large supplies of kaolin

are found in the eastern states; some sulphur is mined in Novada and Utah.

Considerable quantities of marble are quarried in Vermont; sandstone is

found in Ohio, Pennsylvania, Con-necticut, and New York.

Productions.—The U. S. is one of the most productive countries in the world. Her mineral wealth has already been shown, and her vege-table and animal wealth is not inferior. Her extensive forests give large supplies of lumber, the chief woods of commercial value being the white pine, the hemlock, the redwood. oak, spruce, fir, and long-leaved and short-leaved pine. The southern states and the lake region supply the greatest amount of lumber; the Pacific and New England States supply a somewhat smaller amount. Turpentine, tar, and resin are also obtained from the forests. Wheat, oats, barley, and maize are the chief cereals grown. Wheat is grown chiefly in Washington, Minnesota, Indiana, Dakota, Ohio, and Oregon. Oats and barley are grown in the same districts, barley is grown also in California. Maize is largely grown for fattening cattle, chiefly in Kansas, Nebraska, Illinois, Missouri, Indiana, and Ohio. Rice is grown in the swampy parts of Louisiana and Texas, Tobacco is grown in Kentucky, Maryland, N. Carolina, Wisconsin, and Louislana. found in the lakes, including the white Sugar is grown in Louisiana, but beet sugar also is manufactured from beets

island

and is . of Georgia, S. Carolina, and Florida. and the 'upland' cotton, which has a short thread. This is grown on the inland of the south-eastern states. Flax is grown in the U.S. mainly for its seed. The chief centre for it is its seed.

Stock farming.—Sheep, cattle, pigs, and horses are largely reared in the U. S., for pasturage is cheap and plentiful. Cattle and sheep are raised chiefly in the Great Central Plain, the sheep for their wool. Pigs are raised in Iowa, though all the maizement of the characteristic transitions of the companion of growing states have some pigs. Horses are raised largely in Texas, and mules in the southern and western states. Poultry and eggs are important in the

export trade.

Minnesota

Manufactures. - The U.S. have every advantage as a manufacturing country. Coal and iron supplies are abundant: there is an abundance of water power in the eastern states; water communication, both natural and artificial, is excellent. The chief manufactures are those of iron and steel, cottons, woollens, and food nreparation. The chief iron manufactures in Pennsylvania, Alleghany âre ree in Pennsylvania, Alleghany county being the most important district, and Pittsburg the most important town. This state manufactures mainly steel for bridges, frames of buildings, rolled steel, nails, etc. Tools and cutlery are manufactured in the New Forder. manufactured in the New England States, agricultural implements in Illinois and Connecticut. Machinery is largely made in Chicago, New York, Pittsburg, Philadelphia, and Cleve-land. Steel shipbuilding goes on at Philadelphia, San Francisco and other ports. Cottons are manufactured, mainly on the eastern Coastal Plain. The atmosphere is here sufficiently damp for the thread, and the line of falls by which the rivers descend from the Appalachian hills to the plain supplies abundant water power for the working of the machinery. Some of the cotton growing states, e.g. S. Carolina, manufacture as well. Woollens are manufactured mainly in the New England States, more especially in Philadelphia and New York. The manufactures include men's suitings, women's dress goods, carpets, and felts. Silk is manufactured in New Jersey, New York, and Pennsylvania. Food manu-

grown in Michigan and California the largest centres for this industry; Cotton is very largely grown in the from this industry arises leather U.S., in the south-eastern part of the countr cester in Massachusetts. Flour milling is carried on mainly at Minneapolis, St. Paul, and at Superior, Fruit and salmon are canned very largely on the Pacific coast. Other very important industries are glass making. boat making, ready-made clothing manufacture, and coopering.

Communications and railways,—
The great rivers and the great lakes of the U. S. render communication easy. The latter, with the 'Soo' Canal and the Canadian Canal, gives unbroken connection between Oswego on Lake Ontario, and Duluth at the western end of Lake Superior, a distance of over 1000 m. Chicago is connected by water with the Atlantic connected by water with the Ablands by means of the lakes, the Eric Ganal, and the St. Lawrence R. The railroad mileage of the U. S. is enormous, amounting to over 213,000 m. The chief railways are the Northern Pacific, which runs from Chicago, through Duluth, to Portland, Oregon, whence branch lines run to Puget Sound and San Francisco: the Union and Central San Francisco; the Union and Central Pacific Railway, which runs from Chicago to Omaha, Cheyenne Ogden (Sait Lake City is on a branch line from Ogden) to San Francisco; the Southern Pacific Railway runs from New Orleans W. across the Rockies to Los Angeles and San Francisco. There are also coast lines from New York to Industrials New York to Industrials. York to Jacksonville, New York to New Orleans, and lines from Chicago to New Orleans, and from Kansas to Washington. Other great lines are the Pennsylvania and New York Central, both systems communicating between the East and Chicago, and having numerous branches. There are several connections with Canada.

are several connections with Canada.

Trade.—The U.S. has a very large coasting trade, the main ports for this being New York, Philadelphia, Baltimore, to Charleston, New Orleans and Galveston on the E. and S. coasts. On the W. coast the chief ports for the coasting trade are San Francisco, Puget Sound, and Portland. The foreign trade is also very large, the total exports from June 1911 to June 1912 amounting to £465,308,200, and imports amounting to £349,846,300. The U. S.'s best to £349,846,300. The U. S.'s best customer is the United Kingdom. The chief steamship lines are between New York and Bremen, London, Southampton, Liverpool, and Hamburg. Boston also has regular comand Pennsylvania. Food manu-nunications with Liverpool, London, factures and industries are important. Glasgow, and with the chief Canadian They include the preparation of ports. Baltimore, Philadelphia, and cattle, sheep, and pigs for export. New Orleans are important ports for Chicago, Omaha, and Kansas City are trade with the United Kingdom and

ron, both raw and manufactured; guese, discovered the mouth of the copper, oils, lumber, cattle; tinned meat, fruit, and fish; hides, and tobacco. One third of the exports are tobacco. One third of the exports are of manufactured goods. The chief imports are coffee, tea, cocoa, india-rubber, hides and skins, vegetable fibres, sugar, tobacco, silk, chemicals, drugs, lead, raw and manufactured,

rice, spices, and wines.

Population.—The figures for the 1910 census are gradually becoming available. They show a total pop. of 101,467,302. In this total are included \$1,732,687 whites; 9,828,294 negroes; 265,683 Indians; and 142,666 others of Mongol origin. Owing to the vast immigration into the U.S., the pop. is extremely mixed. Of the whites mentioned above, 13,343,583 are foreign-born, and this, of course, takes no account of the enormous number of descendants of foreign immigrants; 2,499,200 of the foreignborn whites come from Germany, emigration from which, however, is on the decline. Emigration to the U.S. from Italy, Russia, Austria, and Mexico is rapidly increasing. table on p. 371 gives particulars as to pop. in the various states, with certain other particulars.

HISTORY: (1) Discovery and colonisation.—The earliest inhabitants American Indians or Indians) were of Mongol extraction (see AMERICAN INDIANS). There is abundant evidence that some parts of America were known to Norse adventurers from Norway as early as the 10th century. But there do not appear to be many traces of their having made permanent settlements. It is possible that some vague rumours of their journeys had come to the ears of Christopher Columbus (q.v.) when he set out on Friday, Aug. 3, 1492, to discover the western route to India. He sighted one of the Bahama Islands on Oct. 12, and landed the following day. After cruising about for some time, he returned to Spain. He made in all four voyages to the New World for treasure-getting and discovery. discoveries never extended beyond certain of the W. India Islands, and parts of Central America. Among the earliest of his followers was Amerigo Vespucci (q.v.), who in 1497- Jersey). Both were reconquered by 98 explored the coasts of the Gulf of the Dutch in 1673, but ceded again Mexico, and who has given his name to the whole continent. In 1498 John and Sebastian Cabot sailed by the Quakers under William Penn

for Europe. The chief port of the W. coast is San Francisco, which trades with England, S. America, Japan, China, and Australasia.

Exports.—The chief exports of the E. coast of America from Labrador to Cape Hatteras. The shores of the Guil of Mexico and modern Florida were explored by Pineda, Ponce de Leon, and Ayllon—Pineda, Ponce de Leon, an Exports.—The chief exports of the U. S. are cotton, raw and manufactured, wheat and wheat flour, coal, 1521. In 1521 Fagundes, a Portuguia of the country of

During the early part of the 16th century French settlements were made along the St. Lawrence, and Spanish settlements in Florida and the south of N. America. In 1585 at the instigation of Raleigh a party English colonists went out and founded the colony of Virginia, so-called in honour of the Virgin Queen, Elizabeth. All perished or returned to England. In 1607 another attempt to colonise Virginia was made, and after many disasters it was successful. Religious persecutions led to the founding of further colonies in the 17th century. In 1620 the band of Puritans commonly known as 'The Pilgrim Fathers fled in the Mayflower from persecution and were founders of what were later the New England States. The foundation of Massachusetts by the Puritans followed soon afterwards. By the middle of the century settlements extending over some five hundred miles of coast had been made by Puritan emigrants. During the by Puritan emigrants. During the Protectorated these colonies consistently supported the parliament and the army. After the Restoration, however, an attack was made on their liberties and privi-The work of destroying the democratic constitutions of these colonies was entrusted by James II. to Sir Edmund Andros. His efforts were fiercely resisted, and were stopped by the accession of William III. Meanwhile, a group of colonies to the S. of the New England States had been growing up. In 1632 the Roman Catholic colony of Maryland had been founded by Lord Baltimore. But within very few years it became Protestant in feeling. In 1663 N. and S. Carolina were founded, the settlers being chiefly episcopalian.

In 1664 the Dutch settlement of New Engseized in an

manner by New York. f land E. of

the Delaware and round its mouth which, originally a Swedish settle-ment, had come into the hands of the Dutch in 1655 (the modern Now in 1674.

In 1681 Pennsylvania was founded

State and Abbreviation		Date of Admission to the Union	Gross Area ² in square miles	Population	Capita1
Alabama	Al.	1819	51,998 113,956 53,335 158,297	2.138,093	Montgomery
Arizona	Ariz.	1912	113,956	2,138,093 204,354	Phœnix
Arkansas	Ark.	1836	53,335	1.754.449	Little Rock
California	Cal.	1850	158,297	2,377,549	Sacramento
Colorado	Col.	1876		799,024	Denver Hartford
¹ Connecticut ¹ Delaware	Conn. Del.		4,965 2,370 58,666 59,265 53,888	1,114,756 202,322 752,619 2,609,121	Dover
Florida	Fla.	1845	58,666	752,522	Tallahassee
¹Georgia	Ga.	;	59,265	2.609.121	Atlanta
Idaho	Ĭď.	1890	53.888	325.594	Boisé :
Illinois	III.	1818	56,665 36,354	325,594 5,638,591	Springfield
Indiana	Ind.	, 1816	36,354	2,700,876 2,224,771	Indianapolis
Iowa	_Ia.	1846	56,147	2,224,771	Des Moines
Kansas	Kan.	1861	82,158	1,690,949	Topeka Frankfort
Kentucky Louisiana	Ky. La.	1792 1812	$\frac{40,598}{48,506}$	1,090,949 2,289,905 1,656,388 742,371 1,295,346 3,366,416 2,810,173	Baton Rouge
Maine	31.	1820	33,040	742 371	Augusta
Maryland	Md. Mass.		33,040 12,327 8,266	1.295.346	Annapolis
¹ Massachusett	s Mass.	;	8,266	3,366,416	Boston
Michigan Minnesota	Micn.	1837	37.300		Lansing
	Minn.	. 1858		2,075,708	St. Paul
Mississippi	Miss.	1817	46,865	1,797,114	Jackson City
Missouri	Mont.	1821 1889	69,420 146,997	3,293,335 376,053	Jefferson City Helena
Montana Nebraska	Mont. Neb.		77,520	1 199 914	Lincoln
Novada	Nov	1864	110,690	1,192,214 81,875	Carson City
New Hampsh	ire N.H.	1001	9,341	430,572	Concord
New Jersey	N.J.	,	9,341 8,224 122,634	430,572 2,537,167 327,301	Trenton
New Mexico	N.M.	1912	122,634	327,301	Santa Fé
New Hampsh New Jersey New Mexico New York	Ŋ,Y.		49.204	9,113,614	Albany
N. Carolina	N.C.		52,426	2,206,287	Raleigh Bismarck
N. Dakota	N. Dak. or. N.D.	1889	70,837	577,056	Dismarck
Ohio	0. 11.0.	1803	41,040	4,767,121	Columbus
Oklahoma	Okla.	1907	70,057	1.657.155	Oklahoma City
Oregon	Ore.	1859	96,699	1,657,155 672,765	Salem
¹ Pennsylvania	Pa. or		$45,\!126$	7,665,111	Harrisburg
1Dhada Ta	Penn.		1 010	540 010	Descridence
Rhode Is. S. Carolina	R. I. S.C.		$\frac{1,248}{30,989}$	542,610	Providence Columbia
S. Dakota	S. Dak.	1889	77,615	1,515,400 583,888	Pierre
D. Dunota	or S.D.	1000	11,010	000,000	1,0110
Tennessee	Tenn.	1796	42,022	2,184,789	Nashville
Texas	Tex.	1845	265.896	2,184,789 3,896,542	Austin
Utah	Ųt.	1896	84,990	373,351 355,956	Salt Lake City
Vermont Virginia	Vt. Va.	1791	9,564 $42,627$	9 001 619	Montpelier Richmond
Washington	Wach	1000	69.127	2,061,612 1,141,990 1,221,119 2,333,860	Olympia
W. Virginia	W. Va. Wis.	1863	24,170	1.221.119	Charleston
Wisconsin	Wis.	1848	56,066	2.333.860	Madison
Wyoming	WY.	1890	24,170 56,066 97,914	140,800	Cheyenne
Dist. of Colu	mbia D.C.	17903	70	331,069	Washington
		Date of			
}		Acquisition	า		
Alaska		1868		64.356	Juneau
Hawaii		1900	6,449	64,356 191,909	Honolulu
Philippine Islands		1898–99	115.026	1,035,420	Manila
Porto Rico		1898	3.435	1,118,012	San Juan
Guam Panama Car	ial Zana	1898	210	9,0003	
Samoa	TOTIC	1904	436		
Tutuila ;		1899	77	6,1005	
1	al thirtage	etates	2 Green ca	on remacent	s land and water
The original thirteen states. Gross area represents land and water.					

¹ The original thirteen states. ² Gross area represents land and water Organised. ⁴ Purchased. ⁵ Estimated. ⁶ 1903.

(q.v.), who fixed his capital at Philadelphia. Thus by the time of the Revolution of 1688, the American colonics of England extended along the French settlers to various parts to the Savannah R. to of the English colonics. Long-French fur-traders and Roman incident. Catholic missionaries, who had been shortly after busy exploring and acquiring terri Duquesne, t tory to the N. and W. of the English colonies, had planted settlements in Canada. They had further explored the Great Lakes, and established session of nearly all the points of missionary posts along them, and strategical importance. Supplies and they had made discoveries along the Mississippi, and certain of its tribu-

During the first half of the 18th century, the English colonies flourished, and the number of the colished, and the number of the coi-onists was increased by immigra-tion, not only from England, but from Germany also, where the havoc played by war caused many to seek a more peaceful home beyond the seas. The beginnings of slave labour in the southern states are traceable to this period. This period also saw the foundation of an efficient educathe foundation of an efficient educational system in the middle colonies and the New England States. Such names as those of Franklin, Bartram, Jonathan Edwards, and Rittenhouse, are a sufficient proof that the educa-tion provided was in no way inefficient. There putes between questions, but

ceeded in agree In 1732 Georgia was founded, being the last of the old thirteen. This was done, in the face of Spanish opposition, largely owing to efforts of John Oglethorpe, who must be regarded as the founder of the income.

Twelve years later, England and France found themselves engaged in a deadly struggle over the question of the Austrian succession. The conflict was not confined to the mother countries, but extended to all the parts where the two nations were parts where the two hands were living in preximity and rivalry. In 1744 the New England colonists, inspired by religious, commercial, and racial motives, attacked and took Louisberg, the capital of Cape Breton, a town of great strategical importance. William Peperell, a merchant, was the English leader. The town was restored by the treaty of Aix-la-Chapelle, which, however, did nothing to settle the respective boundaries of the French and English Fighting, English dominions in America. therefore, went on, the English colonies meeting at Franklin's in-

the coast from the Savannah R. to of the English colonies. Long-Fundy Bay. By the same date fellow's Erangeline deals with this Braddock was killed

session of nearly all the points of strategical importance. Supplies and men were speedily forthcoming from all the English colonies, and troops were sent over from England. In 1758 Wolfe captured the mouth of the St. Lawrence, and Forbes acquired the site of Fort Duquesne (modern Pittsburg). In 1759 following lattice of Ougles. men were speedily forthcoming from lowed the famous battle of Quebec, in which the English under Wolfo defeated the French under Montcalm. Both leaders perished in the battle. Montreal and the W. of Canada came into English hands soon afterwards. England was now supreme in N. America. At the peace of Paris in 1763 Canada, French Louisiann, and W. Florida were ceded to England by East Florida was relinquished by Spain, who obtained in compensation Havana

Louisiana to the W. of the Mississippi.
(2) American independence.—The war left the colonies impoverished in men and money, but it had shown them what a small and well-disciplined force could accomplish with capable leaders. England, too, was in need of money. The war had cost her some and also had the leader.

to look regulatic

been ass...the mother countries from the earliest times. This privilege had been grossly abused, and the most absurd restrictions placed on colonial trading. In addition to this, duties had been imposed on various articles of importation, notably on sugar. In 1764 the sugar duties were somewhat reduced by Grenville, the then premier, but fresh imposts were laid on commodities which had been hitherto untaxed. In 1765 a Stamp Act was passed, requiring all news-papers and legal documents to be stamped. The Act was received with great indignation in America, but George III. and Grenville turned a deaf car to remonstrance. broke out in many places in the colonies, while Franklin wrote 'The sun of liberty is set.' In Virginia, stigation to draw up a plan for their Patrick Henry, a young lawyer, mutual defence on July 4, 1754. In sprang into prominence by delivering 1755 an English force under Brad-beforethe State Assembly a passionate

congress which met at New York protested vigorously, and claimed exemption from taxation to which they had not consented. Meanwhile, Rockingham had succeeded Grenville, and, largely owing to the efforts of Wm. Pitt and Lord Camden, the Stamp Act was repealed in 1766. The repealing Act was accompanied, however, by a declaration that 'parliament had a right to bind the colonies in all cases whatever.' Pitt succeeded Rockingwhatever. Pitt succeeded Rockingham, Charles Townshend being made Chancellor of the Exchequer. Taking advantage of Pitt's illness, Townshend introduced, in 1767, a bill for taxing glass and other articles imported into the colonies. Again, the colonies of the colonies o great dissatisfaction was felt in America. In 1769 Boston was occupied by British troops, who were to preserve order in the town. Ill-feeling between the two countries rapidly matured. In 1773 the Boston teamatured. In 1773 the Boston tea-party' incident occurred, owing to what the colonists regarded as an underhand way of attempting to tax them, when 340 chests of tea were thrown into Boston harbour. In 1774 an enlarged Congress made another and more vigorous protest against English attempts at taxation, and voted an address to the king. Parliament refused to give way in spite of the eloquent appeals of Pitt and Burke. War became inevitable. In engagement (Lexington, first 1775) the British under Gage sustained a severe defeat. In the second battle (Bunker's Hill, 1775), they were no more successful.

Washington was now chosen as commander-in-chief, and his efforts at introducing discipline were at once attended with success. In 1776 he compelled the English to evacuate Boston, and marched against New York. After several further American victories, Congress refused to consider themselves as holding authority sider themselves as holding authority from England. In June a committee was appointed to draw up a declaration that the colonies were 'free and independent states.' The statement adopted was drawn up by Thomas Jefferson. On July 4, 1776, this Declaration of Independence was passed by the unanimous votes of Congress, the thirteen states represented thus becoming the U.S. Meanwhile, Howe had been sent out by England with reinforcements and offers of indemnity on submission. The colonists were defeated at Long Island, and this was followed by other

oration full of seditious sentiment. At was obtained from France, General Burgoyne, who had hitherto been very successful, was forced to make a complete capitulation at Saratoga. Washington was, however, defeated at Brandywine R. in September; 1778 saw more time wasted in efforts at conciliation and in indecisive fighting. In 1780 things looked bad for the colonies. Cornwallis took S. Carolina and defeated Gates near Camden. Further British victories followed in the southern states, but the victorious career of Cornwallis was cut short in 1781. He and his forces were blocked up at Yorktown in Virginia, and as the expected relief did not come he was forced to capitulate almost unconditionally on Oct. 19. This ended the war. In 1782 Oct. 19. This ended the war. In 1102 England was forced to recognise the independence of the U.S. Washing-ton was the hero of the day in There were those who America. would have wished him to become

king, but he disdained the offer.

(3) The United States a republic.

(i.) The war had left the U. S. impoverished and exhausted. The army were at first disposed to be trouble-some, but were pacified by the assur-ances of Washington. The seat of government was fixed at a federal city to be prepared for the purpose between Maryland and Virginia, and to be known as Washington. A system of decimal coinage was adopted in The great business, however, of these first years of independence was the settlement of a constitution. Vas the settlement of a constitution.

In Aug. 1787, a rough draft of this was prepared. It provided for the vesting of all legislative and financial matters in Congress, which was to consist of two houses. The executive was to be vested in a president, who was to hold office for four years. Provision was made for the erection of proper judicial tribunals, and for regulating the relations between one regulating the relations between one state and another. This rough draft underwent some alteration during the discussions in Congress, but it was substantially the same as the Constitution of the U. S. to-day.

The first president chosen under this Constitution was George Washington (1789) (q.v.). Alexander Hamilton, who served with distinction in the war and helped to draft the Constitution, proved a considerable power, perhaps only second to Washington, during the next few years. He organised the finances of the country and did much toward the creation of central government. In 1790 Rhode Island was added to the colonial misfortunes. At the end of the year Washington surprised and defeated the English forces at Trenton. With the beginning of 1777 the fortunes of the colonists rose. Help president in 1793. Trouble with the Indians continued, but Wayne in came to Jefferson's ears in 1801, and flieted on them a decisive defeat on he prepared to resist the arrangement. the R. Maumee in 1795, and a treaty of peace was signed at Greenville.

In the previous year the govern-ment had been troubled by an insurrection among the Democratic party in Pennsylvania, who protested in arms against the duties on spirits. Washington took a stern view of the case, and adopted summary measures. After the seizure of several of the leaders, Washington increased the reverence in which he was held by treating the offenders with great In 1795 another war with Great Britain seemed imminent, but was avoided by the diplomatic skill of Washington. The year 1797 saw Washington's farewell to Congress, and as he refused to undertake another term of office he was succeeded as president by John Adams (1735-1836). Adams had been a teacher in early life, and had been one of the first to enunciate republi-can views. Like Washington he was a Federalist. Scarcely had he been elected when war with France seemed to threaten, but the victory, gained in an hour and a half, of the American frigate Constellation over the French L'Insurgent, led to the conclusion of a treaty of peace. On Dec. 14, 1799, Washington died of pneumonia. The House of Representatives declared him to have been 'First in peace, first in war, and first in the hearts of his countrymen.' The presidential elections of 1801 saw Thomas Jefferson (1743-1826), who called himself a Republican, but whose views in some ways resembled rather those of the modern Democratic party, who claim descent from the Republican party, made the third president. A census taken in 1800 gave a population of taken in 1900 gave a population of 5,308,483, showing the remarkable increase of 1,500,000 in ten years. This argued prosperity, and the growth of prosperity was aided by the administration of Jefferson. the administration of Jefferson. (For his share in drawing up the Declaration of Independence, see above.) Earlier, he had come into prominence as a member of the Virginian Congress, and he had acted as American as a member of the beautiful as American as a member of the land acted as American as a member of the bad acted as American as a member of the bad acted as American acted as Amer acted as American ambassador at wolt which Paris. Under Adams (1797-1801) he had been vice-president. His demoratic sentiments soon manifested party, and did his best to secure themselves in the temperate property of British hostility to the gramme of peace and the put heart Congress. he put before Congress.

An American attack on saided to the Unic...

most remarkable event of Jesseson's met with great success. The English presidency was the acquisition of frigates were repeatedly defeated in Louisiana. The yeast territories of

presidency was the acquisition of Louisiana. The vast territories of Louisiana to the W. of the Mississippi had been ceded to France by Spain secretly, in 1800. The news of this

But, in 1803, the French, fearing that the English might take it, offered to sell it to the U.S. for 80,000,000 francs (\$15,500,000 or £3,200,000). Monroe, who had been commissioned to treat merely for the purchase of New Orleans and the Floridas, hastened to close with the offer. The U.S. thus, for a trifling sum, doubled her territories and became possessed of a new and rich field for her people's activities. This was Jefferson's greatest achievement, though he was not alone responsible for it. Shortly afterwards Illino kaski:

1801 of the U.S. Supreme Court must be regarded as an event of enormous importance in the constitutional history of the country. For thirty-four years, until his death, he continued to expound with great force the functions of national government and to exert an influence upon legislation that has proved lasting. In 1805, the Constitution having been slightly revised, Jefferson was re-elected president. In 1807 great annoyance was caused by the assumption by Britain of the right to search neutral vessels and by the high-handed action of the Leopard in searching the American frigate Chesapeake. Americanshipping being injured by both the orders in council and the Milan degree, Congress placed an embargo on foreign trade. This was repealed in 1809. In 1809 Jefferson having refused re-nomination, James Madison (1751-1836) was elected president. The fourth president, who was a lawyer by profession, was a follower of Jefferson's creed, and like him was the son of a planter. His presidency covers the period of the war with England. This unhappy struggle was largely caused by the obstinacy of Canning, who refused to entertain negotiations for the opening of free trade with the U.S., while Napoleon did his best to foment strife. In March 1811 Congress refused England.

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THE PRESIDENTS OF THE UNITED STATES OF AMERICA (1789 - 1913)



1. GEORGE WASHINGTON (1789-97). Federalist.



Federalist.



2. John Adams (1797-1801). 3. Thomas Jefferson (1801-9). Republican.

gains and losses about equal. 1814 a rising of the Creek Indians was subdued by Jackson at the battle of in European quarrels. the Horseshoe. The Indians never again gave considerable trouble. The famous naval duel between the Eng-Shannon and the American Chesapeake, resulting in an English victory, completed the story of these fights, in all but the last of which the U.S. had been successful, The U.S. ot. S. had occasion. The U.S. attempt to conquer Canada was responsible for much bloodshed, but resulted in no substantial gain to either side. In the course of the war Washington was taken, sacked, and burnt (1814). A treaty of peace was signed at Ghent a few days before the American victory at Naw Orleans American victory at New Orleans (1814). The treaty left nearly all the points of difference unsettled, but the English were forced to give up the more arrogant of their claims before the war. The next few years are not marked by events of any great importance; Congress was chiefly engaged in the consideration of matters of domestic importance, and it was in these years that the demand for protection for American industries began to come into prominence. In 1817 Monroe (1758-1831) succeeded Madison, who followed precedent in refusing re-nomination. A lawyer in early life, he had foug of Independence and into public life (see Louisiana, abore). He was American sors he was representative in Paris during part of tinguished the Revolution. As president he was the lineal successor in views to his rederalists, translated are constant. immediate predecessors. Ho was particularly lucky in his subordinates. He was Few men have had so keen a sense of the public feeling as Monroe. He speedily put an end to the border skirmishing in the S. between Indians and whites (1817-18). In doing so, and whites (1817-18). In doing so, however, he came into conflict with Spain. But by a treaty of Feb. 1822, Florida was secured to the U.S., and a territorial government was set up in the next year, Spain gaining Texas. The request of Missouri to be admitted to the Union led to the reopening of the question of the slave trade: Should Missouri has a slave-nowning state. be admitted as a slave-owning state or only on conditions? The matter was settled by the Missouri Com-

promise,' which admitted a part of Missouri to the Union unconditionally but prohibited slavery to the N. of the line 36° 30'. In 1823 was promul-gated the polley always known as the

In democratic principles, and moreover did not wish America to be embroiled Monroe rose to the occasion, and in his message to Congress Dec. 2, 1823, said that the U.S. could not see her 'free and independent condition' assailed by European interference in America. He pointed out that the alliance had a different political scheme from that America, and declared that the U.S. would consider any attempt on the allies' part ' to extend their system to any portion of this hemisphere as dangerous to our peace and safety. The U.S. would not interfere with European colonies in America, but with governments whose independence they had acknowledged they would not brook interference. The American continent must, further, not be regarded as subject to future colonisation by European powers. The Monroe doctrine thus does not establish a protectorate of the U.S. over other American countries. But in its practical bearings it does mean that the U.S. has to defend the rest of America from European Intervention, and to allow the American nations 'to work out their own destinies.'

(4) The United States a republic .-(ii.) Monroe was succeeded as presithe son of the second

a very strong supporter of the Federalists, he became, after the passing of the Embargo Bill, a fol-lower of Jefferson, though his opinions were still Federalistic. He held several official posts before obtaining the presidency. He was elected by the House of Representatives after the electors had cast a majority, though not a sufficient majority, of votes for Jackson. A good man and a skilful statesman, Adams had not the power of enlisting popular sympathy. presidency is marked by the opening presidency is marked by the opening of the first American railway, and by the opening of the Eric Canal. In 1829 he was beaten for the presidency by Andrew Jackson (1767-1845), also a lawyer. He had done much fighting against the Indians, first as a private soldier and later as general.

be overlooked. During Auntits a prosidency he was continually in oppo-sition to the president, seeking Monroe doctrine, which is the foundation of the U.S. foreign policy. The occasion was the attempt of the the president, seeking occasion of l clection occasion was the attempt of the rection with Holy Alliance (q.v.) to stamp out to not very republicanism in S. America. The tactics. Hour in the party sense and in the other;

personally as attractive as his presented annexation of Texas. On this cry remembered as 'the People's President.' It was he who inaugurated the elected president in 1845. He had system of a wholesale change of office-holders with the accession to power of a new party. The year 1829 saw widespread dissatisfaction in the saw widespread dissatisfaction in the S. with the tariff laws, which, they considered, gave protection to manufactures without adequate protection of agriculture. Threats were even made of secession. In Jan. 1830 Webster made a wonderful reply in Congress to this threat. No more was heard of secession. In 1832 a nullification proclamation regularity the cation proclamation, refuting the right claimed by S. Carolina to nullify certain tariffs settled by Congress, was issued by Jackson, and won him popularity in the N. of the U. S. In 1833 a compromise tariff was agreed upon, reducing all rates over 20 per cent. Jackson was re-elected in 1833. He made a determined attack on the National Bank, which led to its being closed in 1836. This and other unwise acts led to a financial crisis in 1837. The presidential elections of this year resulted in the choice of Jackson's nominee, Martin van Buren (1782-1862), a man of Dutch extraction, a political adherent of Jackson, and also a lawyer. He entered politics at eighteen, and speedily rose to office, being in succession attorney-general, governor of New York, a member of Jackson's cabinet, and American ambassador to England. His first address touched on the subject of slavery, and proposed a plan for dealing with the financial panic—that of 'the independent treasury.' This was embodied in the Sub-Treasury Bill (1837-40), which was finally passed in 1840, though the financial situation had improved in the meanwhile, only to lead to a second panic. In 1841 Van Buren, standing as an Independent Democrat, was defeated by the Whig nominee, William Henry Harrison (1773-1841), a descendant of the English regicide. He had successi fully governed Indiana, but though solid, sincere, and practical, he had few of the higher gifts of statesmanship. He died within a month of his election, and was succeeded by Tyler, the vice-president (1790-1862), a Democrat. Tyler had taken some part in public life, but was little known to the majority. He expressed his interior of following Hermann and the succeeding the succeedi pressed his intention of following Harrison's policy, but came into conflict with the Whigs on the tariff question of 1842. In 1843 the Webster-Ashburton treaty, the credit for which on the U.S. side lay between Webster and

been a supporter of Jackson and Speaker of Congress. In 1845 Texas was annexed and her representatives was annexed and her representatives admitted to Congress. War with Mexico followed. Taylor defeated the Mexicans at Palo Alto and elsewhere. Mexicans at Paio Alto and circwhere. He gained a brilliant victory at Buena Vista, and Scott another at Cerro Cordo. In 1848 a peace was concluded, ceding to the U.S. Texas and a large stretch of land to the W. This result was a great triumph for the pro-slavery party. In 1846 Ore-gon had been annexed. In 1849 the Whig nominee, Zachary Taylor Whig nominee, Zachary Taylor (1784-1850) was chosen president, a brave soldier but vain and untrained in statecraft. The year 1850 is famous for the Compromise Measures, known as the Compromise of 1850. Henry Clay, one of the distinguished statesmen of the period, led this movement for the preservation of the Union. One of the most important measures passed was a Fugitive Slave Law. Clay, Webster, and John Calhoun, all three disappointed presidential candidates, now old men, took part in the discussion to allay the conflict between the North and the South which was inevitably approaching. Which was inevitably approximate. The Fugitive Slave Law provided that runaway slaves found in the free states could be recovered, and made other slave regulations, Webster other slave regulations, Webster going over to the pro-slave party. Taylor's death in 1850 made Millard Fillimore president (1800-74), a Whig and a strong party man. In early life a lawyer, he had always been a keen politician. The period is marked chiefly by an apparent cossation of party differences, which were so soon to blaze up in a different form into civil war. In 1853 Franklin Pierce (1804-69), a Democrat, became president, a man of pleasing manners but otherwise colourless. He was a supporter of slavery, and during his term porter of slavery, and during his term of office feeling on the slave question began to run high. In 1857 he was succeeded by James Buchanan (1791-1868), another Democrat and proslave enthusiast. The year 1857 saw a legal decision of great importance on the slavery question. This was the Dred Scott case. The judges decided that it was legal for slave owners to carry their slaves into non-slave states, and in effect tore up the Missonri compromise. Anti-slavery feelsouri compromise. Anti-slavery feeling was growing rapidly. At this time there were in the U. S. 4,000,000 negro slaves. In 1859 John Brown, an anti-slavery fanatic, made a raid Tyler, was made between the U.S. an anti-slavery fanatic, made a raid and England for the suppression of into Virginia and seized a govern-African slave-traders. The southern ment arsenal. He was hanged by the



4. James Madison (1809-17). Republican.



5. James Monroe (1817-25). Republican,



6. John Quincy Adams (1825-29). 7. Andrew Jackson (1829-37). Republican. Democrat.







8. Martin Van Buren (1837-41). 9. William Henry Harrison (1841). Democrat. Whig.





10. John Tyler (1841-45). 11. James Knox Polk (1845-49). Democrat.



12. Zachary Taylor (1849-50). 13. Millard Fillmore (1850-53). Whig.







14. Franklin Pierce (1853-57). 15. James Buchanan (1857-61). Democrat.

In 1861

government, but his acalarmed the slave-owners. Abraham Lincoln (1809-65), a Republican and strenuous opponent of slavery, was elected president on a minority popular vote. Brought up in the 'backwoods,' self educated, homely, he was a man of strong ethical sense and sterling qualities of mind: to-day he is generally regarded as the most characteristic product of the American democracy. On his election; the southern states seceded from the Union, with Jefferson Davis (1808-89) as president, the questions deciding them on this step being slavery and self-government. The N. deter-mined to resist, and the Civil War (1861-65) was begun by the S. at Fort Sumter. The two sides were divided by a line roughly corresponding to the thirty-seventh degree of latitude. The battles of the war were many and bloody. Antietam (Sept. 1862) and Gettysburg (July 1863) were the scenes of terrible carnage. In both of these the Federal (Northern) states were successful. In 1863 Lincoln is Emancipation issued his famous Proclamation, which liberated many slaves, and in the same year Grant captured Vicksburg. The year 1864 is chiefly notable for Sherman's march from Chattanooga through Georgia to the sea, with his army singing 'John Brown's Body 'for a marching tune. The same year, the Confederate (Southern) ship Alabama which had been fitted out in England -a neglect for which England had to pay £3,250,000 damages after the war—was sunk by the Federal Kearley in a seventy minutes' combat. In 1865 was fought the battle of the Five Forks, in which the Confederates under Lee were utterly defeated by Sheridan. The war was practically ended by the surrender of Lee at Appomattox on April 9, 1865. Before the amnesty was signed, however, Lincoln was assassinated. Jefferson Davis fled, but was recaptured and kept in nominal confinement. (5) Modern America. - Lincoln's successor in 1865 was Andrew Johnson (1808-75). The war left the U.S. impoverished, and beset by many political difficulties. Johnson, moreover, was not a success. He had little

sense of dignity and quarrelled with Congress. An attempt to impeach him in 1868 only failed by one vote. But he possessed a certain amount of honesty and tact, and did do some-thing to reconcile the sullen southern states to the Union. In 1867 Alaska was purchased by the U. S. from Russia. In 1869 Ulysses Simpson

but his action had strenuous and, on the whole, very successful attempts to deal with the financial situation. By an amendment to the Constitution in 1870, negroes were given equal rights with cident

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of the summed to one negroes. Thank, who was the most able general during the war, and is one of the national heroes, was not so successful in the presidency. During his administra-tion the greedy office-seekers and plunderers exerted great influence over him, and political morality reached a low ebb owing to the power of the Republican caucus. In 1877 Rutherford Birchard Hayes, a Republican (1822-93), became president. The years of his presidency were politically barren. The Republicans had become hopelessly corrupted, while the Democrats were divided against themselves. Besides which. the old cries were beginning to become stale, and fresh issues were only just coming to the fore. These were, however, years of commercial expansion and prosperity. In 1881 James Abram Garfield (1831-81), a Republican, was elected president, but was shot dead shortly afterwards. His place was taken by Chester Alan Arthur (1830-86), the vice-president. In 1882 a reform of the tariff was discussed, and continued to be the chief topic of debate till 1884, the presidential elections resulted in the overthrow of the Republicans and the election of Cleveland (1837-1908), a Democrat. The victory of the Democrats was largely on the tariff question, the majority of the people being desirous of a reduction. did not mean a break-up of the old party lines, but it did mean a change of issues in the fight between the parties. Like so many of his prede-cessors, Grover Cleveland was a cessors, Grover Cloveland was a lawyer in early life and had held several official positions. His administration was marked by great prosperity, and by a free use of the veto power by the president. An ex-tensive reform of the Civil Service was carried out, resulting in a cleaner and carried out, resulting in a cleaner and more efficient public service. In 1889 Cleveland was defeated by Harrison, the Republican candidate (1833-1901), the grandson of the ninth president. He had fought for the Union army in the Civil War, and had in the senate. on the tariff he McKinley

The unpopu-Grant (1822-85) was made eighteenth larity of this measure led to the president, being also a Republican. downfall of the Republican party in The dominant political party made 1893 and Cleveland was elected to a S. Dakota, Montana, and Washington a distinguished inscorian, and masser admitted to the Union (1889), and Idaho and Wyoming in the versity. He is a unique figure among following year. Cleveland's second period of office was marked by silver legislation (1893), by the settlement by arbitration of a dispute with England over the Venezuelan boundary, and by a slight reduction of the McKinley tariff embodied in the Wilson Bill. In 1897 William McKinley the Republican candidate the Wilson Bill. In 1097 winners McKinley, the Republican candidate (1843-1901), was chosen as president. He, too, had fought in the Civil War, and had consistently advocated a high resident of the Ningley Bill (1897). tariff policy. The Dingley Bill (1897) provided for high protection for U.S. industries. The attention of the U.S. was drawn in 1898 to the misgovernment of Cuba, which was in a state ment of Cuba, which was in a state of anarchy, owing to the inefficiency of Spain, to whom it belonged. In order to end this state of affairs, the U. S. battleship Maine was sent to Havana, where it was blown up mysteriously. The U. S. attributed this to the Spanish government, and declared war. Spanish government, and declared war. Spanish fleets were destroyed at Manila and Santiago, and in 1898 the peace of Paris gave Cuba its independence and handed the Philippines and Porto Rico over to the U.S., who in the same year an nexed Hawaii. A revolt in the Philippines in 1899 was suppressed. In 1901 McKinley was re-elected president, but was assassinated the same year. He was succeeded by Theodore Roosevelt (b. 1858), of course also a Republican, a man of enormous activity and energy. In 1901 the Hay-Pauncefote treaty with Great Britain regulated the relations of the two countries with regard to the Isthmian Canal. In 1902 the U. S. bought for £8,000,000 rights over the Panama Canal, and in 1904 bought from Panama a strip of land on each side of the canal (see PANAMA CANAL). In 1905 Roosevelt was re-elected by the largest popular vote at that time on record. The years 1906-8 are marked by attacks by the president marked by attacks by the president on the power of the trusts at home, and by the policy of the 'big stick' in foreign relations. In 1909 W. H. Taft (b. 1857) was elected on a Rooseveltian programme of antitrust legislation and promises of a reduced tariff. In 1910-11 attempts were made at a Reciprocity of Duties Treaty with Canada, so as to establish freer trade between the two countries. The Canadian general election of 1911 gave an emphatic negative to the proposal. In 1913 Woodrow Wilson (b. 1856) swept the country on a Democratic programme, country on a Democratic programme,

second term of office. During Harri-Republican ex-presidents (Roosevelt son's tenure of the presidency, N. and and Taft) opposed to him. Wilson is S. Dakota, Montana, and Washington a distinguished historian, and has

United

American soil is George Sandy's translation of Ovid (published 1626). But this, like so many of the early monuments of American literature, has little that is distinctive of the New World about it. There are in the early annals of American literature a great many sermons, pam-phlets, and letters, but these claim than a literary point of view. Roger Williams's Bloudy Tenent of Persecution (1644) was one of the earliest pleas for all-round religious toleration. Anne Bradstreet's poems and Wigglesworth's poem, The Day of Doom (1662), are also worthy of mention. But with the 18th century American literature begins to strike a more distinctive note. Two great a more distinctive note. I we great Puritan divines are notable in the early part of the century. The first is Cotton Mather (1663-1728), whose learned and able, if somewhat ill-arranged Magnalia Christi Americana (1702) is of great historical and theological importance. The other is Jonathan Edwards (1702-58), whose exposition of the Calvinistic conception of the universe (in the Freedom of the Will, 1754, and the Treatise on Original Sin, 1758) is the ablest setting forth of that system of theology. Benjamin Franklin's theology. Benjamin Franklin's (1706-90) works are notable as the expression of a manly and vigorous personality. His Aulobiography (published 1817) is plain-spoken and self-revealing to an unusual but not to an excessive extent. His style is a model of plain yet forcible prose. a model of plain yet forcible prose. He also wrote largely on contemporary politics. Political writing was, indeed, the kind most practised in the mdidle and later years of the century. Jefferson's Declaration (see above), The Federalist (1788), the speeches and pamphlets of Washington and others come under Washington and others, come under Washington and others, come under this heading. John Woolman's Journal is one of the finest Quaker books, and has received high praise from the pens of Lamb and others. A very naïve and refreshing book, praised by Hazlitt and Lamb, is St. John de Crevecœur's Letters of an American Farmer (1782), which describes simple personal emotions and having a clear majority over the two scribes simple personal emotions and



ABRAHAM LINCOLN (1861-65).
 Republican.
 ANDREW JOHNSON (1865-69).





18. ULYSSES SIMPSON GRANT (1869-77). Republican.



19. RUTHERFORD BIRCHARD HAYES (1877-81). Republican.



20. James Abram Garfield (1881). 21. Chester Alan Arthur (1881-85). Republican. Republican.





22 and 24. GROVER CLEVELAND (1885-89 and 1893-97). Democrat.



23. Benjamin Harrison (1889-93). Republican.



25. William McKinley (1897-1901). 26. Theodore Roosevelt (1901-9). Republican.





27. WILLIAM HOWARD TAFT (1909-13) Republican.



28. WOODROW WILSON (1913). Democrat.

life and customs in the colonies. Webster's speeches are wonderful efforts of oratory (for incidents in his life see above); but, like all 'oratory, suffer somewhat unless we are familiar with their occasion. Freedom, however, has seldom had a more cloquent tongue to sound her praises. Lincoln's speeches and letters, are also among the classics. One of the also among the classics. One of the greatest names in American belies lettres is that of Washington Irving (1783-1859). His first great success was his History of New York (1809), written in vein of wholly delightful humour. His Sketch Book (1819) included 'Rip Van Winkle,' perhaps the most widely read of his writings. Bracebridge Hull followed, and then came several historical works dealing chiefly with Snain. His later works chiefly with Spain. His later works are not up to the level of these earlier ones. His style is well-knit, and has great variety of movement. He has the highest powers of sympathetic humour, rhetorical grace, and vivid description. Gifts of quite another kind were bestowed upon another kind were pessoned apple Fenimore Cooper (1789-1851). He had passed a part of his boyhood among the Red Indians, and what he had seen had sunk deeply into his mind. This served as the inspiration for the novels which have been the delight of generation after generation of schoolboys of all ages. Among them may be named The Last of the Mohicans (1826), The Pathfinder (1840), and The Deerslayer (1841). Though his writing is unequal, both as between his different books and within the limits of a single book, he was possessed of the highest narrawas possessed of the highest narrative gifts. His style possessed the highest gift of all—that of being unnoticed by the reader. He never gets between the reader and his meaning. Like Scott. Cooper had many imitators. William Cullen Bryant (1794-1878) was one of the earliest of America's poets. Trained to admire the school of Pope, he soon, like Wordsworth, saw that a new departure in poetry was necessary. The poetry of his mature years sary. The poetry of his mature years is distinctively American in its subject-matter, and individual in its treatment. He had fine descriptive powers, and could with uncring eye detect the outstanding features of a landscape and "reproduce them in verse. His patriotic verse shows a sincere belief in the value of freedom. He never fully realised the promise he gave in *Thanatopsis*, his fluest and best-known poem, though the fact is generally lost sight of that the poem as it now stands includes a number of changes that were made in later years. His translation of the *Iliad* appeared those who care for sincerly and in 1870, that of the *Odyssey* in 1871-strength, combined with a strong

Edgar Allan Poe (1809-49) is famous both as poet and writer of short stories. His tales include The MS. found in a Bollle, The Fall of the House of Usher, and Tales of the Grolesque and Arabesque. These are the products of a prodigal imagination with the products of a prodigal imagination with the second the products of a promism magnation running riot over the fields of the marvellous. They are unequalled for weird and powerful effect. His poems—the best known of which are: The Raven, Ulalume, The Bells, and Annabel Lee—are distinguished by Annabel Lec—are distinguished by great charm of melody, real power of lyric expression, and a perfect command of lyric form. Poe's influence on modern French literature has been considerable. The best known abroad of America's poets is H. W. Longfellow (1807-82). Educated at Bowdoin College, he was appointed in 1836 Smith professor. He taught for many years, but this aspect of his work speedily became subordinated to his work as a poet. Among his Among his

Voices of the 1.

1847; Golden Hiawatha appeared, and in 1858 Inc Courtship of Miles Standish. Tales of a Wayside Inn were published in 1863 and in 1867-70 a translation of Dante. The volumes named contain his best work. Longfellow's poetry has been accused, like Tennyson's, of a want of intellectual force, but this probably arises from the very familiarity which it has acquired on both sides of the Atlantic. His work has much of Wordsworth's simplicity, and all his work is the expression of a grave, yet gentle and kindly personality. Ho had a very considerable command of metre, and his metrical effects are often both striking and agreeable. His popularity is attested by the frequency with which some of his typical poems, such as The Psalm of Life, The Village Blacksmith, etc., are quoted by the common people. Hardly inferior and all his work is the expression of a Hardly interior common people. Hardly inferior to his works are the poems of J. G. Whittier (1807-92), the Quaker poet. Whittier (1807-92), the Quaker poet. In early life a journalist of the anti-slavery party, he wrote a very large number of poems on the subject of slavery and the war, though his Quaker principles forbade him to participate in the fight. His 'early volumes include Lays of My Home, 1843; Songs of Labour, 1850; The Panorama, 1856. His great success came with Snowbound (1868). In 1867 he issued The Tent on the Beach. 1867 he issued The Tent on the Beach. His last volume was called At Sundown. Snowbound is his masterpiece, unexcelled for descriptive vividness and felicity of phrase. A true and tender poet, he lives in the hearts of those who care for sincerity and

had early dedicated himself to poetry, and in 1841 published A Year's Life. In 1848 came The Vision of Sir Launfal, and in the same year appeared The Biglow Papers. The latter were a powerful satire on the Mexican War, and did much to shape A second series of public opinion. Biglow Papers appeared later order to satirise the Civil War. in other poetical works include a Commemoration Ode (1865), Under the Willows (1869), The Cathedral (1870), Hearts-ease and Rue (1888). His poetry is distinguished by a strong reforming and ethical bias and a sincere directness of expression. early verse often contains quaint plays of poetical fancy, and he was never afraid of using comic effects in verse. Nearly all his poems reflect a true and intimate knowledge of nature. Lowell is also an essayist of great distinction. His best-known volumes are: My Study Windows and Essays on the English Poets. His prose is always eminently clear and readable, and his literary essays, though sometimes perverse in their judgments, are stimulating and sugrestive. Another writer of heft years gestive. Another writer of both verse and prose is O. W. Holmes (1809-94). He was early attracted to literature, and when twenty wrote the poem Old Ironsides. The works of Holmes most widely read to-day are the Breakfast Table series of essays, The Autocrat, The Professor, and The Poet. He also wrote some novels, and many poems are included in the volumes of essays. His essays have a lively and unflagging humour, powers of keen satire—particularly satire on the Calvinists—tenderness, and grace. His poems have a graceful charm which is all their own, the best-known being The Chambered Nautilus, and the ever-delightful Deacon's Masterpiece or the Wonderful Constitution of the Chamber of the Wonderful Constitution of the Wonderful Cons XII

religious sentiment. Longiellow was pressed in a style at once illuminat-succeeded as professor at Harvard ing, arresting, vivid and impassioned. by J. R. Lowell (1819-91). Lowell There are few who are not stimulated by reading him. His message to the ages is expressed in all his work, but is to be found practically complete in the essays on Nature, Self-Reliance, and Compensation. For him, 'The Universe is the externisation of the soul,' and 'America is a poem in our eyes: its ample geography dazzles the important and it will be the important of the imp the imagination, and it will not wait long for metres. Working rather by the suddenly illuminating lightning flash which reveals the falsities of the world than by logical argument, he has gained recognition as a thinker and prophet wherever English is and prophet wherever Emplan as spoken. His poetry, which falls below the level of his prose, is marked by intellectual power rather than true poetical expression. His nature poems, such as Woodnotes, give a poems, such as Woodnotes, give a faithful and charming rendering of certain aspects of country life. Emerson's friend, H. D. Thoreau (1817-62), ranks inferior only to Emerson as a transcendental writer and thinker. A fine scholar, and possessed of a note characteristic of the New World, his fame is still growing among the Anglo-Saxon races. His greatest and best known work is Walden, or Life in the Woods (1854), but he also wrote other volumes of description and essays (A Week on the Concord; Miscellanies, etc.). Thoreau is one of the most individual writers in the world. His works reflect the man—they are full of whimsicality, eccentricity, felicitous description, sudden excursions into philosophical ground, and are per-vaded like Emerson's with a strong ethical sense. His style is similarly varied—it can be plain or ornate, straightforward or epigrammatic, grave and studied, or light and grave and studied, or light and whimsical. Though he never made form his chief study, his form will be found invariably the most suited to his matter. John Burroughs (b. 1837) Deacon's Masterpiece or the Wonderful of the Moss' Shay. The lotty and original genius of R. W. Emerson (1803-82) has been a powerful force in the history of 19th century thought and literature. In early life a school-master and a Unitarian minister, he left the Unitarian body, owing to religious differences. His first publication of note was Nature (1836), which was not well received by the public, but the value of which was public but the value of which was of his life he lived mainly by his lecturing and later by his books. His chief works are: Essays (two series); and a volume of poems. His transcendental philosophy is exhis matter. John Burrougns (0, 1881) may be mentioned with Emerson and Thoreau. His three great inspirations have been Emerson, Walt Whitman, and Matthew Arnold, the first awakening his religious nature, the second stirring him by his humanity, the third teaching the necessity of clear expression. Bur-

(1819-92),not till 1855 that his first really great book Leaves of Grass appeared. His later poems include Drum-Taps, a record of his work as a nurse in the Civil War. He wrote in prose Speci-men Days in America and Democratic Vistas. Whitman has been called 'the first democrat,' and there is something to be said for this. What seems like brag in his work is often merely a sense of his dignity as the mouthpiece of democracy. His verse is unrhymed and unmetrical in the ordinary sense of 'metre,' but it has a swinging energy and abounds in happy phrases. That his neglect of rhyme and the ordinary rhythms was not due to inability to write ordinary or the to mainty to write ordinary verse is proved by his noble poem on the death of Lincoln, O Captain! My Captain! Other poets of America are Bayard Taylor (1825-78), who in addition to many fine lyrics made a wonderful translation of Goethe's Faust; C. G. Leland (1824-1903), translator of Heine and author of Hans Breitmann's Ballads; Sidney Lanier, E. R. Sill, Richard Hovey, T. B. Aldrich, E. C. Stedman, R. W. Gilder, and J. B. Tabb. Among contemporary poets one might man temporary poets one might men-tion J. W. Riley, Blies Carman, and Joaquin Miller (Songs of the Sierras). If the songs of a nation are to be included in its literary heritage then one must take account of John Howard Payne (1791-1852), author of Home, Sweet Home, and Julia Ward Howe (1819-1910), author of the stirring Battle Hymn of the Residual Control of the Stirring Control of the Stirring Battle Hymn of the Residual Control of the Stirring Battle Hymn of the Residual Control of the Stirring Battle Hymn of the Residual Control of the Stirring Control of the Sti public, which was composed at the beginning of the Civil War. Among the really great novelists one must consider Nathaniel Hawthorne

(1804-64). Recognition as a novelist did not come to him soon, and his stories were written as interludes in a

exhibit the finest t story-telling. He ha-for form and for the

poraries. But his prevailing temper incident. A type in which Americans is romantic, not in the sense in which Scott's is romantic, but in his power to feel the glory and beauty of the Rev England past, without adding a meretricious glamour by the aid of the sense in which Hawiten Hawing. Mrs. Wharton, are masters of international reputation in this sense in which the sense in which have been conspicuously successful from the first is the short story. James, Mrs. Wharton, are masters of international reputation in this

who started his realistic and dramatic narrative, it literary career as a novelist. It was owes its large fame chiefly to its being a portrayal of certain scenes and conditions in connection with problems which then agitated the N. and S. Later great American novelists are Bret Harte (1839-1902), who, while painting the Far West in no flattering colours, has shown that rough externals may conceal real greatness of soul, and his fellow-humorist 'Mark Twain' (S. L. Clemens), whose laughter has in it the philosophy of a keen observer of life, and is quite free from vulgarity and offence, Henry James (b. 1843) is one of the greatest novelists of the second half of the century. He has carried the psychological analysis of human motives to its fullest development in fiction. His style is quite individual, but is admirably suited to his purpose, and while often cloquent and ornate it is never merely grandiose. A distinguished disciple of his method is Mrs. Edith Wharton (b. 1862), who, if somewhat less subtle in her power of suggestion, is correspondingly more simple in style. William Dean Howells (b. 1837) is the founder and head of the realistic school, paying scrupulous attention to detail and deriving something of its method from the Russians. Mary E. Wilkins (Mrs. C. M. Freeman) is an important member of this group. Her stories deal with the commonplaces of New England life, and are astonishingly well written. Frank Norris (1870-1902), who lived to complete only two books of his projected trilogy of the 'epic of the wheat,' is the most significant of 'sociological' novelists. He has sometimes been compared to Zola, while David Graham Phillips (1867-1911), owing to his comprehensive outlook on American life, has been called the 'American Balzac.' Thomas Nelson busy diplomatic career. His greatest Page is the author of some striking works are: The Scarlet Leller, The stories of Southern life. Weir Mitchell House of the Seven Gables, and The Marble Faun, together with his novelists of note, writing on American stories for children, The Wonderbook subjects, while Francis Marion Crawand Tanglewood Tales. His works ford (1854-1909) concerns himself exhibit the finest t with foreign history. Hi of

and is thus in a sense classical, his author of was a master of the works being to this extent greatly in other stories, was a master of the advance of his English contembration and whimsteal a meretrinious giamour of the and of external trappings. Though Harriet Beecher Stowe (1811-96) wrote many 1909) is famous for a single short novels, she is best known by Uncle Tom's Cabin (1851-52). A well-told, new school of short-story writers has bably no author is more popular. Co-George Bancroft (1800-91), whose incidently, a new school of humour voluminous History of the United has risen in the writings of F. P. States, from the Discovery of America Dunne, creator of the sagacious Mr. to the Inauguration of Washington Dooley, and George Ade, author of (1834-85), though old-fashioned now Fables in Slang. Earlier humorists in its style and thought, had exeraside from 'Mark Twain' are Charles eff. Browne ('Artemus Ward') (1834-1850), the latter of Uncle Remus's Grove, Samusing dialect fantasies. In the summary of American literature one can hardly omit the names of Sarah Margaret Fuller ('Ossoli') (1810-50), R. H. Dana (1815-82), author of Two Years Before the Mast, and Donald G. Mitchell (1822-1908), author of Reveries of a Bachelor and Gilbert Stuart (1735-1815), author of great American historians three

Pontiac (1851), a stirring story. of the French and English in America.

developed in recent years. The famous Rise of the Dutch Republic founder of this school is 'O. Henry' (1856), which was followed by The (William Sydney Porter) (1867-1910), United Netherlands (1860-68). For who in The Four Million and other vigour and earnestness, pictorial who in The Four Multon and other vigour and eathersteen, previous books, wrote of the life of the people, imagination and rhetorical power, and employed the American idiom he is unexcelled among historians, with much original power. Pro-Among other historians there is bably no author is more popular. Co-George Bancroft (1800-91), whose

Of great American historians three may be grouped here. W. H. Prescott (1796-1859) is the first of these. Is43) and John Vanderlyn (1776-1859) is the first of these. Is43) and John Vanderlyn (1776-1859) is the first of these. Is43) and John Vanderlyn (1776-1859) is the first of these. Is43) and John Vanderlyn (1776-1859) is the first of these. Is52), were influenced by the worked with great courage, and early turned his attention to historical study. His first great work art. This was the Hudson River was The History of Ferdinand and Isabella (1836), a monumental work Landscape was its favourite theme. displaying enormous reading and In the fifties the influence of Düsselresearch. In 1843 appeared the History of the Conquest of Mexico. and in research. In 1843 appeared the History of the Conquest of Mexico, and in 1847 his greatest work, The Conquest of Mexico, and in 1847 his greatest work, The Conquest the last half century France has been 1847 his greatest work, The Conquest the dominating factor in the art of America, as in the art of Office of America, as in the art of Office of America, as in the art of Office of Of Francis Parkman, who also early in first American painter to put them life decided to be an historian. His into practice. Inness was the first first and perhaps his greatest his great native landscape painter. Since torical work was The Conspiracy of Inness, America has been particularly ronuac (1601), a stirring story strong in this branch of the art, and vividly told. In a series of volumes among the brilliant landscape painters (The Pioneers of France in the New may be mentioned the names of World. 1865; The Jesuits in North Alexander H. Wyant, Homer D. America, 1867; The Old Régime in Martin, Dwight W. Tryon, Theodore Canada, 1874; Count Frontenai and Robinson, Childe Hassam, and John New France, 1877; Montcalm and Twachtman. The last three belong Wolfe, 1884) he treated of the history to the Impressionist school. Twachtman strong in this branch of the art, and man, who died in 1902, was a painter He had brilliant powers of description of great poetic refinement, probably and his narrative never flags for a the finest landscape painter America moment. J. L. Motley (1814-77), has produced. Winslow Homer (1834-shared Prescott's and Parkman's 1910) is generally acknowledged to be gifts of vivid and picturesque dethe most American in his art. His scription. He started as an historical paintings of the sea are distinguished novelist, but turned to history proper, for their vigour and character rather and about 1845 conceived the plan of than for their facile technique. writing a history of the Dutch. The Among artists of international repu-outcome of this was his world tation who have worked mostly abroad

are James McNeill Whistler (1834-1903), who influenced by Velasquez and the Japanese, is known as the creator of portrait 'arrangements,' is his best-known composition. Other colour 'symphonies,' and 'nocturnes'; E. A. Abbey (1852-1911), Chadwick, Frederick S. Converse, Rubin Goldknown for his exquisite pen drawings, illustrations to Shakespeare, and illustrations to Shakespeare, and panel decorations in colours; Mary Cassatt, who belongs to the Impressionist school, and has painted very charming studies of mothers and children; John S. Sargent (b. 1856), the most prominent portrait painter of the day. Other painters worth mentioning are: George Fuller (1822-84), W. M. Chase, Charles W. Hawthorne, and A. P. Ryder. The lastnamed is a painter of rare Poe-like imagination, and his 'moonlights' show beautiful if weird effects. The so-called New York school includes some of the best painters of the day, Robert Henri, George Luks, John Sloan, William Glackens, George Bellows, all realists and following more or less democratic traditions. Edward Redfield heads a vigorous landscape school in Pennsylvania. mentioning are: George Fuller (1822landscape school in Pennsylvania. A. B. Davies, John Marin (water-colourist), and Maurice Prendergast are among those who follow the more modern tendencies. Until the Centennial Exposition in

1876, the classic influence reigned 1876, the classic innuence reigned supreme in sculpture. Houdon's visit in 1785 had no great influence. The first sculptors followed Canova. Not until Henry K. Brown (1814-86) and his pupil, J. Q. A. Ward (1830-1910), did any sculptor show a spark of national feeling. Ward found investigation in the figures of Indians and spiration in the figures of Indians and negroes. America's most famous sculptor is Augustus Saint Gaudens (1848-1907), whose statues have an austere beauty, and are modern, tempered somewhat though classic feeling. There was a sense of dignified restraint in all he did. pupil, Frederick MacMonnies (b. 1863) shows a more decided French influence. His sculpture is modern, realistic, and shows a more agitated feeling. Other prominent sculptors are W. O. Partridge, Herbert Adams, Paul Bartlett, Karl Bitter, Lorado Taft, Solon H. Borglum, George G. Barnard, and Charles Grafly. Rodin has been the great influence among the younger men, but there are others who prefer to treat native subjects in a bluntly realistic manner.

Music, as a creative art, is of comparatively recent growth in the U.S. Among the earlier men Louis Moreau Gottschalk (1829-69), composer of Creole music, has a European reputa-tion. Edward A. MacDowell (1861-1908), creator of symphonies, con-certos, sonatas, and songs, is the

composers of note are George W. Chadwick, Frederick S. Converse, Rubin Gold-

1. Victor Herare authors of many popular operas and songs. Inventions, industrial achievements,

ctc.—The invention of the cotton gin in 1793 revolutionised the cotton industry. In 1807 Robert Fulton's Clermoni, tried on the Hudson, proved to be the first successful experiment in steam navigation. In 1837 Samuel F. B. Morse exhibited the telegraph. In 1841 Richard M. Hoe brought out the rotary press for printing news-papers. In 1844 the first telegraph was set up between Baltimore and Washington. In 1845 Elias Howe invented the sewing machine. first trans-Atlantic cable, establishing communication between the U.S. and England, was laid in 1858. The Remington typewriter, shown in 1873, was invented by C. L. Sholes in 1868. In 1868 George Westinghouse devised the air-brake now employed on all railroads. In 1876 Alexander Graham Bell secured letters patent for his telephone. 1877 Thomas Edison invented the phonograph; in 1879 the incandescent light; in 1887 the Pyro-magnetic dynamo, and in 1893 the kinetoscope, which was the original form of the cinematograph. Wireless between cinematograph. Wireless between U. S. and England was established in 1903. The first railroad tunnels under the Hudson, connecting New Jersey and Manhattan Island, were opened in 1908. By far the most important undertaking in recent years has been the Panama Canal (q.v.). condi-

Architecture.—Commercial tions have evolved during the eightics the 'skyscraper,' a structure whose skeleton of steel, before completion, has the appearance of a huge cage. These buildings are being built tailer "hether

. in the York, ty four scraper' surely deserves the name of

American architecture. Various efforts have been made to beautify the skyscraper.

Education is universal and compulsory in the elementary stages, and ranges from the kindergarten to the university. 7.7 per cent of the total population over ten years are illiterpast neglect of negroes, 30'4 percent. of whom are illiterate. The control of education is exercised by the state and local authorities in conjunction. Elementary education is imposed on all between six and fourteen years of age, and is the most democratic in the world. The public elementary schools are maintained by local taxation. There are also numerous secondary or high schools giving further instruction. Some institutions described as universities correspond rather to the English high schools. Many of these receive state grants, and most are run on the basis of co-education. University education in the U.S. is well provided for. There are some five hundred universities and university colleges, and numerous professional and technological institutions, embracing in all some 300,000 students of both sexes, and about 28,000 professors other instructors. and American scholars are well to the forefront in all branches of knowledge, especially in such subjects as English language and literature, psychology, education, and the various technical studies.

United.

andFederalConstitution governments.-For details as to the history of the Constitution, see above. There are three main factors in the U.S. government—the Executive, the Legislature, and the Judicial Authority. The president possesses the executive power, and is elected every fourth year by electors chosen by each state to a number equal to the number of senators and representatives for that state, no senator or representative being eligible as an elector. Voting is by ballot. Should the result not give a clear majority to any candidate, the House of Representatives chooses from among the top three candidates. In the event of the president's death, the vice-president acts as president till the next election. Provision is also made for a president in the event of the death of a vice-president who has succeeded to the presidency. The legislature consists of two houses—a Senate, elected for six years, and a House of Repre-sentatives for two. The president has veto power, which can be overridden by a two-thirds vote of each house. The senators are chosen by the state legislatures, the representatives by popular vote. The judicial power rests with a chief justice and eight justices, who are appointed by the president. In addition each state has a legislature, with varying conditions as to election of senators and representatives, but in all cases consisting of two houses and a governor appointed for from two to four years.

Army and navy.—The U. S. army, which is recruited on a voluntary

basis, must not exceed 100,000. present strength (1913) is about 4500 officers and 80,000 men. In addition there are the various state militias. amounting in all to over 100,000 men. The navy is efficient and well-manned. There are at present (1913) in service or under construction 38 first-class battleships, 12 armoured cruisers, 22 protected cruisers, 13 gunboats, 49 submarine torpedo boats, 56 destomarine torpedo boats, 56 destroyers, and various others, amounting in all to 399 vessels. The U. S. total expenditure on armaments for 1912-13 is 216,607,213 dollars.

Weights and Measures.—Same as

those of the United Kingdom, with a few unimportant exceptions. unused. The currency is based on a metric scale, the unit being the dol-

metric scale, the unit being the dollar (=100 cents.), which is nearly 4s. 1%d. English.

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Units are standards, arbitrarily chosen, in terms of which quantities be expressed. Scientifically may U. are of two kinds, viz., fundamental and derived. The fundamental Us. are those in terms of which all others be expressed. The units can length, time, and mass are accepted as fundamental and all other Us. can be derived from these. The English system of dynamical Us. is called the foot-pound-second system, since the Us. of length, mass, and time are the foot, the pound, and the second respectively. In this system the U. of area or of surface is a square foot, i.e.

adopted scientific system is the C.G.S. system, or the centimetre - gram-second system. This system, having the Us. suggested by its designation, is advantageous in that each U. is exactly ten times the next smaller U. of the same kind and hence in changing Us. there is no tedious arithmetic Also the Us. of length, involved. mass, and time are conveniently related, since the mass of a certain known volume of water can quickly be obtained, 1 gram being the mass of 1 cubic centimetre of water at 4° C. Us. of force, work, and velocity, etc.. involve two or all of the fundamental U. in their definition. Thus the U. of velocity is that velocity with which a point passes over U. distance in U. time (i.e., 1 cm. per sec. or 1 ft. per sec. according to the system of U., C.G.S. or F.P.S.). Two systems of electrical Us. are derived from the C.G.S. system, viz., the electro-static and the electro-magnetic. For the definitions of the various U. see ELECTRICITY, MAGNETISM, FORCE, WATT, AMPERE, OHM, VOLT, VELOCITY, etc. See also Everett, Units and Physical Constants, 1891.

Univalves (Lat. unus, one; valva, valve), a division of molluses formed on account of the shell consisting of a single piece. All gastropods are U. Universal, the abstract conception

which is drawn from a multitude of objects of the same class, and which embodies the features common to all. Thus man in the abstract is a universal term, while an individual man is the particular. It is thus equivalent in some way to the Platonic 'idea. For the great medieval controversy as to the real existence of Us., sce Nominalism.

Universalists, primarily those who hold the opinion first definitely upheld by Origen, that all men and even would be saved, was common in the early centuries and is not uncommon to-day. The name U. is also given to a sect founded in 1774 in America by A later important John Murray. member of the sect was Hosea Ballon, whose advanced Unitarian beliefs have now been widely accepted have now been among all Universalist churches. See Farrar, Elernal Hope, and Eddy. Universalism in America, 1884-86. Universal Language. At most

a square whose length and breadth is | did so at the time of Christ, in the I ft. For measurements of volume, middle ages Latin was everywhere the U. is a cubic foot. The Us. of spoken by the learned, while at the area and of volume are in two and present time English and French may three dimensions respectively. The been the dream of many, however, to construct an artificial language which shall either supplant national tongues or act as their auxiliary. In 1879 appeared Volapuk, which owed its origin to Johann Martin Schleigh. More famous in our own day is

Esperanto, invented by Dr. Zamenhof. Universal Time, a system of reckoning time to be uniformly used throughout the civilised world for international purposes. Its use was agreed upon at the International Conference at Washington in 1883. By it the day is considered as one of twenty-four hours. The circumference of the earth is divided into twenty-four parts of 15° each, and a local time is fixed for each, in which all odd minutes and seconds are ignored. Thus the local times differ from the U. T. only by even hours.

Universe, a term generally used as the word world once was, to signify the collection of all created things. By the technical term theory of the universe is understood what is known of the general arrangement of planets, stars, etc., and of their connection

with one another. Universities are corporations, either lay or clerical, which have since the 12th century had the charge of educating the members of the learned professions throughout Europe and the colonies founded by European states. In its earliest uses the term universidas was not confined to scientific bodies, but was used in a general sense equivalent to our modern word corporation. This was the Roman sense of the word, and it was long before it gained its present

" date of urope is ne con-

y cathethe devils themselves will finally be dral and monastery of Europe there saved. This opinion, or a modified has, from a very early period, been form of it which said that all mon attached a school in which were instructed all candidates for the priestand such laymen as afford it. It appears from the letters of Abelard (d. 1142) and from other contemporary sources, that in Paris the poorer establishments entrusted the conduct of this school to one of their number called the Scholasticus, and that the wealthier bodies maintained a Scholasticus to instruct the junior pupils in grammar and philosophy, and a Theologus to instruct periods in the world's history some the more advanced in theology, one language has naturally tended to About the time of Abelard large assume the position of a U. L. Greek numbers of young men began to

move in the direction of Paris, and science. For the various modern U. the reputation of Abelard himself did see separate articles on each. much to make the name of Paris everywhere famous. A more elaborate organisation became necessary, but the Parisian organisation is marked by being primarily in the hands of the teachers and doctors. At the head stood the rector, elected by the four faculties of theology, arts, law, and medicine. The members of the U. were divided into four nations, France, Picardy, English (later German), and Normandy. At an early period colleges were established period colleges were established within the U. of Paris by private families or religious orders. Originally they were intended exclusively for poor scholars, who were to live in them subject to a certain discipline. By degrees, as more numerous and able teachers were employed in these colleges, they assumed the character of boarding houses for all classes of students. The growth and organisation of the U. of Paris has here been dealt with in some detail as being the most famous example of that class of U. in which the government rested almost entirely with the teachers. Opposed to Paris in this respect was Bologna. Here all jurisdiction rested with the students, who elected their own governors. During the middle own governors. During the middle ages Paris was the home of scholasticism, Bologna was pre-eminent in the study of canon-law, and a third U., Salerno, was famous for its medical school. The growth of U. throughout Europe was rapid. Before the Reformation they were established in Italy, France, the German empire, Spain, Great Britain, and even among the Slavonic nations E. even among the Slavonic nations E. of the Germans. In all of these we recognise the leading features of Paris or Bologna. With the revival of learning, which came at the time of the Reformation, the old U. underwent some change and many new ones were founded. They almost entirely left their clerical character. lost their clerical character, other sciences were added, and the power of the U. was gradually restricted. spread of learning prevented monopoly by close corporations, and the invention of printing co-operating with the extension of elementary and secondary schools did much to raise the standard of education among those classes which did not receive a U. education. In no way less considerable is the change which has passed over the U. of Europe during the past century. The general expansion of men's minds, due to the marvellous inventions of the time and the crued of civilizations have and the spread of civilisation, has made this necessary, while the most important single factor is the rapid advance made in the study of natural

University College, see London.
University College, Oxford, dates
from the year 1249, when William,
Archdeacon of Durham, bequeathed a sum of money to maintain certain graduates of the university, the institution obtaining the name 'The Great Hall of the University,' which is still part of its designation. Later on, however, legend named King Alfred as the founder and assigned 872 as the date.

University Settlements, those houses found now in many of our large cities where a number of educated men and women live in order to improve by their influence the social and in-tellectual condition of the poorer tellectual condition of the poorer parts. The scheme began among certain Oxford men, who in the early 'sixties began to spend their vacations together in Whitechapel and Stepney. The first regular establishment, Toynbee Hall (q.v.), was made in this district in 1884. Other settlements in London are Oxford House (Bethnal Green), Cambridge House, and the Women's University Settlement (Blackfriars Boad). Such settlement (Blackfriars Road). Such settlements are also seen in Glasgow and Edinburgh and in many American cities, where they are better known as social settlements.

Unleavened Bread is made of flour and water without the addition of yeast. It was ordered to be used among the Jews during the time of Passover, and from its supposed use by Jesus at the Last Supper was almost invariably used in the West for the Eucharist. Its use for this purpose is obligatory in the Roman Church, but is unknown throughout the East.

Unna, a tn. of Westphalia, Prussia, 10 m. N.E. of Dortmund. There are salt works, springs, and a bathing establishment, also coal mines and iron works. Pop. 17,381.

Unreason, Abbot of, see ABBOT OF

UNREASON and FOOLS, FEAST OF. Unsaturated Compounds. Organ Organic compounds which contain carbon atoms that can combine directly with other atoms or groups are said to be unsaturated. This depends upon the view that the valency of atoms is fixed. Carbon is represented as quadrivalent, oxygen as divalent, and hydrogen monovalent.

(methyl alcohol) are saturated, but the new on the E., the two being carbon monoxide C=O, and ethylicined by five bridges. It is a town

-Ċ lene H--H are obviously not

saturated. In the graphic formulæ of all such substances, the particular carbon atoms are represented as joined by a double band or linking; thus ethylene $H^2 = C = C = H^2$. Substances formed by the direct union of U. C. with other atoms are called 'additive products.' See Va-

Unsoundness, see WARRANTY Unst, an island of the Shetlands, Scotland, 38 m. N.E. of Lerwick, with an extent of 29,850 acres. It is It is 12 m. long and its greatest width is 5½ m. Balta and Uvea Sounds afford

safe anchorage.

Unterwalden, a forest canton of Switzerland, lying to the S. of the Lake of Lucerne. It is divided into Lake of Lucerne. It is divided into Obwalden (area 183 sq. m.) and Nidwalden (area 112 sq. m.). Pasturm.) and age and dairy work are the chief industries. It was one of the founders of the Confederacy. Total pop. 30,914.

Unwin, William Cawthorne (b. 1838), an engineer, born in Essex. He became instructor at the Royal School of Naval Architecture, 1868; pro-fessor at the Royal Indian Engineering College, 1872; and at the Central Technical College of the Guilds of London, 1884. He has served on London, 1884. numerous commissions and learned societies, and is the author of many valuable works.

Unyoro, a dist. of British E. Africa, lying N.W. of Uganda, between lakes Albert and Ibrahim. Area about 32,000 sq. m. Pop. (Wanyoros) un-

known.

Upanished, occ VPDANTA

Upas-tre E. species of See Antiaris. Indies.

Upernivik, or Upernavik, northern-most Danish settlement in Green-land, on an island off W. coast; lat. 70° 48′ N.

Uphall, a par. and vil. of Linlith-gowshire, Scotland, on Brox Burn, 5 m. S.E. of Linlithgow. Pop. (1911)

12,767. Upolu, sce Samoa.

Uppingham, a market tn. in the co. of Rutland, England, with a fine church, St. Peter and St. Paul, and a public school of importance, which dates from the 16th century, and is capable of receiving between 400 and 500 scholars. Pop. (1901) 2588.

Upsala, the cap. of the lin of Upsala, Sweden, on both sides of the R. Tyris, 40 m. N.W. of Stockholm. The old town. is on the W. bank and Ural.

of great historical interest. Its university, with which Linneus was connected, was founded in 1477 and 1879-86. In the Gothic cathedral (1230-1435) are buried Gustavus Adolphus and Linnaus. Pop. 25,960.

Upton, a tn. of Worcestershire. England, on R. Severn, 6 m. N.W. of

Tewkesbury, with trade in cider. Pop. of reg. dist. (1911) 6620. Ur, called in the Bible 'Ur of the Chaldees,' an ancient city of S. Chaldees,' an ancient city of S. Babylonia, at the meeting of the Euphrates, the canal Shat-el-Hai, and the Wady Rummein; identified with

modern Mugheir.

Uramia, a toxic condition caused by insufficient excretion of urea. It may be brought about by kidney disease, or may be central nervous in origin, metabolism being disturbed through lack of the necessary stimuli to secretion. The presence of urea in the system brings about toxic effects; the nerve centres are poisoned and there is often a comatose or uncoordinated condition which often re sembles drunkenness. Three varieties are recognised: acute, latent, and chronic. In acute cases bleeding by the application of leeches is productive of good effects. In chronic cases a regular course of Turkish baths is said to have the effect of stimulating excretion and so diminishing the excess of urea.

Ural, or Yaik, a riv. of Russia rising in U. Mts. in the govt. of Orenburg. It flows S. to Orsk; then N. to Orenburg and Uralsk, and again S. to the Caspian Sea, which it enters by many branches, forming a large delta. For many miles it is the boundary between Europe and Asia. Length

1335 m. It has large fisheries.
Uralite: 1. A pyroxene (augite)
which has been altered to an amphibole (hornblende). The crystals have the form of angite, but the cleavage of hornblende. It is found in the Urals, Norway, the Tyrol, and in India. 2. The name given to a fre-India. 2. The name given to a fire-proof building material composed of chalk, silicate, and bicarbonate of soda and asbestos fibro.

Ural Mountains (the Hyperborean Mountains, or Rhipmi Montes of the ancients) form part of the boundary between Europe and Asia, and sepa-rate European Russia on the W. from Siberia on the E. The chain extends S. from the Kara Sea, an arm of the Arctic Ocean, to the middle course of the Ural R., a distance of about 1333 m. Its breadth varies from 16 to 66 m. The mineral riches of the chain 66 m. are chiefly contained in the Middle commonly called

of the Ural R., the boundary line between Europe and Asia. The capital of the province is Uralsk, 1000 m. S.E. of Moscow, a 17th century town, which is the market for the trade in fish oil and caviare done by the nen on and caviare done by the province. The character of the territory of U. generally is barren and uncultivated. There are large expanses of steppes and deserts fringing the Captain Sec. Call the Caspian Sea. Salt lakes are common. U. is poorly provided with water, and in places is almost unin-habitable. The climate is vigorous and subject to extremes of temperaand subject to extremes of temperature; the snowstorms in winter being very destructive. The chief occupations of the inhabitants are fishing and stock-raising. The history of U is mainly the history of Russia, and the present dwellers there are made up of Russian cossacks, Russian peasants descended from the Nogai tribes and Kirghizes. The area is 137,679 sq. m., and the pop. 775,400. The pop. of the town, the capital of

The pop. of the town, the capital of the province, is 38,919.

Urania, the typical genus of the lepidopterous family Uraniidæ, and consists of night-flying moths. The beautiful Madagascar moth is known in entomology as *U. rhipheus*.

Urania (Gk. δύράνος, heaven), in Greek mythology, one of the Muses the guardian of Astronomy. The name is also one of the appellations

name is also one of the appellations

of Aphrodite.

Uranium (U, 238.5), a metal which occurs as oxide UO2, 2UO, in pitch-blende, and is found in Cornwall, Colorado, and Joachimsthal. The Colorado, and Joachinistical. The metal is prepared by several methods, but may be obtained by the reduction of the chloride with sodium. It is a hard white metal (sp. gr. 18*7), which melts in the electric furnace. Uranium forms the oxides UO₂, UO₃ and UO₄, and also oxides U₂O₄ and U₂O₄, which may be regarded as combinations of may be regarded as combinations of two oxides. Uranium dioxides (UO₂) and trioxide (UO₂) are both basic oxides, the former yielding the un-stable uranous salts (e.g. uranous sulphate U(SO₄)₂) and the latter the uranyl salts (e.g. the nitrate (UO₂) (NO₃)₂). Uranium peroxide UO₄ gives rise to the persurentes UO. The gives rise to the per-uranates. The so-called uranium rays are a property of pitchblende rather than of the metal, and are probably due to radium present.

(metalliferous), and this section also contains the highest peaks, such as the Kanjakovski Kawen (5000 ft.). The chief minerals produced are gold, copper, platinum, and iron.

Uralsk, a ter. of Russia, the larger ligures had to supplement them, the portion of which is situated to the E.

principal stars still bear the Greek letters given them by Bayer.

Uranus, in ancient Greek mythology, the husband of Gæa (Earth) and the father of Cronos (Saturn) and other Titans, Cyclops, and Hecatoncheires. He represents heaven and cheires. He represents heaven and the generative power of the sky with its sun and rain. He was dethroned and mutilated by Cronos, and from his blood were formed the Gigantes on earth and Aphrodite in the sea. The Romans translated the name as

Uranus, the first planet to be discovered since the invention of the telescope, was found by Sir William Herschel on March 13, 1781, and named by him Georgium Sidus in honour of King George III. It is the outermost but one (Neptune) of the planets, its distance from the sun being about trenty times that of the being about twenty times that of the It is four times the earth's diameter, and its mass one-twentieth that of Jupiter. In density it is about the same as the latter planet, i.e. slightly denser than water. Four satellites at least (the number is un-certain) attend U., the plane of their orbits being almost perpendicular to the ecliptic.

Urari, see CURARE. Ura-tiube, Ura-tyube, or Uratepe, a tn. of Russian Turkestan, 100 m. N.E. of Samarkand. It stands on the highway from Fergana to Jizak and has a citadel and many mosques. Pop. 22,000.

Urban, the name of eight popes. Urban I. was pope 222-30.

Urban II. (pope 1088-99), a French-

man by birth, and originally a monk of Cluny. Soon after his election, he resumed possession of Rome, the fortresses of which had been occupied by the anti-pope, whom he compelled to withdraw, and was thus brought or influence, and was thus brought into further conflict with Henry IV. of Germany. A great council was held at Placenza in 1095, in which the anti-pope and his adherents were excommunicated. In his later pontificate U. succeeded in driving Henry IV out of Italy. IV. out of Italy. He held a council at Bari in 1098, in which many Greek bishops were present, and in which the addition of the words filioque to the Creed was discussed. Thence he returned to Rome, of which he obtained full and undisturbed possession; and he died at the close of 1099, Uranometria, a star atlas or cata-just at the time when the first crusade logue published by Bayer in 1601. In it Bayer used Greek letters, the the successful occupation of Jerusalem.

Urban III. (pope 1185-87), he belt came Archbishop of Milan 1182, cardinal 1185, and succeeded Lucius III.

Urban IV. (pope 1261-64), instituted the feast of Corpus Christi, 1264.

Urban V. (pope 1362-70), is remarkable as practically the last of the proper who resided at Avignor, and popes who resided at Avignon, and the one by whom the papal seat was for a time re-transferred to Rome. He was a native of France, and had been Abbot of St. Victor at Marseilles. After various alternations of peace and contest, U. went to Rome in October 1367. He found the papal city in a condition all but ruinous, and the whole of Italy overrun by bands of mercenaries. Heendeavoured to repress these disorders, but with little success; and in 1370 he returned

to Avignon where he died.

Urban VI. (pope 1378-89), under whom the great Western Schism had its origin, when Clement VII. was elected anti-pope in 1378. U.'s name was Bartolomeo Prignano, and at the time of his election he was Archbishop of Bari. Clement took up his residence at Avignon. U., on the contrary, remained at Rome, where he appointed twenty-six new cardinals, and excommunicated Clement and his adherents. U. was recognised as the lawful pope by one portion of the West, Clement by the other, and each maintained his claim by measures of the most extreme character. having engaged in a dispute with Charles, king of Naples, whom he had himself crowned, he was besieged by that prince at Novara, whence he withdrew to Genoa, taking with him, as priso with w eeveral.

way to Ferentino, he fell from his horse, and died from the injuries thus sustained.

VII. (pope Sept. 15-27, Urban1590).

Urban VIII. (pope 1623-44) was the successor of Gregory XV. His family name was Maffeo Barberini. family name was many in the difficult position of Roman arrairs as complicated between France, Austria, and Spain, in the war of the Valtellina, to which he succeeded on his first election, he acquitted himself with much describe His His terity. signalised by

Holy See of th He was 1626.

brated college of the Propaganda, and to him Rome is indebted for many public works, including large and important additions to the Vatican Library. Some of the early stages of the Jansenist controversy fall within this pontificate.

Urbana: 1. The cap, of Champaign co., Ohio, U.S.A., 42 m. N.W. of Columbus; the seat of a Swedenborgian university. Pop. (1910) 7739. 2. The cap, of Champaign co., Illinois, U.S.A.; 61 m. N.W. of Terre Haute, the site of the Illinois University and state laborator. and state laboratory. (1910) 8245.

Urban District Council, see LOCAL

GOVERNMENT.

Urbanists, see Clare, St. Urban Sanitary Authority. Sec LOCAL GOVERNMENT.

Urbi et Orbi, a formula used to signify the universal application of a papal bull, the meaning being ' to the city (Rome) and to the world.'

Urbino (Lat. Urbinum Hortense), a tn. in the prov. of Pesaro e U., the Marches, Italy, between the Foglia and Metauro, 23 m. S. by E. of Rimini. It has a fine ducal palace of the Montefeltro family (1468), a cathedral, free university (1564), and the house in which Raphael was born (1483). (1483).The manufactures include silk, majolica, bricks, and olive oil. Pop. 18,000.

Urdingen, a tn. of Prussia, in the Rhine prov., on the l. b. of the Rhine. Pop. 9758.

Ùrdu, a peculiar dialect spoken in India.

a riv. of N. and W. Ridings, Yorkshire, England, which rises 7 m. S.W. of Mukers, near the borders of It is about 70 m. long and Durham.

and joins the Swale, forming the Ouse, Ure, Alexander (b. 1853), a Scot-tish politician and judge, born at Glasgow, and educated at Glasgow Edinburgh Universities. He was

ed to the Scottish bar in 1878.

Since for he

1909-13 Lord Advocate for Scotland. In Oct. 1913 he was appointed to succeed Lord Dunedin as head of the Scottish judiciary. His name has been prominent among the leaders of the 'Taxation of Land 'campaign. Ure, Andrew (1778-1857), a Scot-tish chemist and scientific writer, horn at Glasgow and studied of

born at Glasgow, and studied at Glasgow and Edinburgh Universities. He was appointed professor of chemistry and natural philosophy in Ander-Glasgow

course for working sorship and went to London, where he practised as an analytical and commercial chemist. Among his works are a Dictionary of Chemistry, 1821; Philosophy of Manufactures, 1835.

of mammals and of carnivorous birds and reptiles. It forms about 3 per cent. of the human urine. It may be pre-pared from urine by evaporation to small bulk and adding strong nitric acid. The precipitated crude urea nitrate is recrystallised from nitric acid and dissolved in water. The with solution is then decomposed barium carbonate, evaporated to dryness, and the urea extracted with alcohol. In the laboratory, urea is more commonly prepared by heating ammonium cyanate. It forms colourless crystals (melting point 132° C.) soluble in water and alcohol, and combines with acids to form salts. It is decomposed on heating, and heated with sodium hypobromite gives off nitrogen. This latter property is used as a method of estimation. Urea was discovered in urine in 1773, and was artificially produced by Wohler in 1828, the discovery being of funda-mental importance as the first synthetical production of an animal product.

Uredinaceæ, see Rust Fungi.

Urethra, in anatomy is the urinary canal extending from the neck of the bladder to the meatus urinarius, or orifice of the urethra.

orince of the urethra.

Urfa, or Urfah, see EDESSA.

Urfé, Honoré D' (1567-1625), a
French writer, born at Marseilles.
His life, like his writings, was extremely romantic. After serving for some time in the wars of Henry IV.
he married Diane de Château Morand, but the union was an unhappy one. His chief production was the pastoral romance L'Astrée (1610-18), which enjoyed unparalleled popularity for

nearly half a century.

Urga, also called Bogdo Khuren,
a tn. of Mongolia on the R. Tola,
180 m. S.E. of Kiachta. The city is divided into two main sections, the quarter and the Mongol Chinese Besides these there is a religious or monastic quarter, which is important as containing the residence of the Kutukta Lama, the head of the Mongolian Buddhists. It is It is important commercal centre.

Pop. 30,000.

Urgel, or Seo de Urgel, a tn. of Spain, in the prov. of Lerida, situated on the R. Segre, 74 m. N.W. of Barcelona; it is the see of a bishop, who supervises the republic of Andorra. Pop. 3000.

Urgeng, or Urgheni, a tn. of Russian Central Asia, in the Khanate and 17 m. N.E. of Khiva. It is also called New U. as opposed to the deserted Old U. Pop. 32,500.

Uri, one of the forest cantons of Switzerland.

Switzerland.

Urea, or Carbamide, CO(NH₂)₂, a Lake of Lucerne and the cantons of compound which occurs in the urine Schwyz, Glarus, Grisons, Ticino. Schwyz, Glarus, Grisons, Ti Valais, Bern, and Unterwalden. principal river is the Reuss, whilst the St. Gothard Railway crosses the canton. Cattle-rearing is carried on, also cheese-making and bec-keeping, but more than half the surface is own is Altdorf. The canton was the scene of fighting between the French and the Russians and Austrians in 1799. Area 415 sq. m. Pop. 18,500 (principality Pop. 18,6 Catholics).

Urial, Oorial, or Ovis vignei, known also as the Punjab wild sheep, a species of the genus Ovis, found species of the genus Ovis, found chiefly in the Punjab, Afghanistan, and Persia. It has large, twisted horns, firmly set in the skull. The curve in the male is particularly

great.

Uric Acid (C₅H₄N₄O₅), a product of the metabolism of the animal organism, and occurs in small quantities in human urine. It sometimes accumulates in the bladder, forming 'stones,' or is deposited in the tissues of the body (gout and rheumatism). The excrements of birds (guano) and of reptiles contains large quantities of the acid. Serpents' excrements conthe acid. Serpents excrements consist chiefly of ammonium urate and the U. A. is prepared by boiling with caustic soda and the clear alkaline solution precipitated with hydrochloric acid. The acid forms crystals which are insoluble in water. Evaporated with nitric acid, a yellow stain is left, which becomes intensely violet on addition of ammonia. U. A. is a weak dibasic acid, and forms salts which are all sparingly soluble in water. The lithium salt is fairly soluble, and hence lithium compounds are used in medicine for gout and rheumatism,

Uriconium, see WROXETER. Urim and Thummin, two objects mentioned in the scripture narrative (P) as oracles through which the will of Yarweh was discovered on certain The occasions. earliest reference made to them is in I Sam. xiv. 41 ff, but no description of them is given in any place nor is anything more now known. They seem in some way to have been connected with the ephod or breastplate and served the purpose of lots. The R.V. translates by 'Light' and 'Perfections' (Exod. xxviii. 30).

Urinary Calculus, see CALCULUS.
Urine, the fluid excreted by the kidneys. It contains a large proportion of water together with some of the waste products of metabolism. The kidneys extract these waste products from the blood and pour their It is bounded by the secretions into the ureter, by which

ents are secreted in different parts of the kidney tubule. The water and some salts are separated out at the glomerulus at the commencement of each tubule, and the other con- be stituents are added in the convolumineral salts and organic substances, mainly nitrogenous. The mineral salts are chlorides, sulphates, and The chief chloride is phosphates. common salt, which varies in amount according to the amount in the food. The sulphates are formed by the oxioxidation of phosphorus on the most and should not be allowed to arms substances in the tissues. The most and should not be allowed to arms important of the nitrogenous products in the U. is urea (CON.H. hould be added to the contains about 90 per cent. (hould be added to the contains about 90 per cent. (hould be added to the contains about 90 per cent. (hould be added to the contains about 90 per cent. (hould be added to the contains about 90 per cent. (hould be added to the contains about 90 per cent. (hould be added to the contains a c the total nitrogen excreted. Urea formed in the liver from the amino- of U. may be due to over-distension acids resulting from the digestion of owing to stricture of the urctima. It proteins. About 4 per cent. of the may be cured by treating the stricture. proteins. About 4 per cent. of the nitrogen in U. is contained in ammonia, which can often be detected by its odour. Other nitrogenous subby its odour. Other nitrogenous substances present in U. are uric acid, hippuric acid, and creatinin. Uric acid is present in excess in the U. of gouty patients. The amount of U. discharged by an adult man is about. 2½ pints per diem on the average. The quantity, however, is susceptible of wide variation, as it depends to a lease extent upon the amount of fluid. large extent upon the amount of fluid ingested, the amount excreted by the skin and lungs, etc. The excretion of U. also varies with the state of bodily health. *Polyuria*, or excessive discharge of U., may be caused by the use of one of the drugs known as diurctics, by diabetes mellitus, or by diabetes insipidus. A decrease in the amount of U. is caused by certain fevers, by forms of kidney inflammation, from obstruction in the urinary passages, etc. Abnormal constituents in the U. are often indicative of morbid conditions. A condition marked by the presence of blood or blood pigment is known as hamaturia. This is indicative of injury or inflammation in kidney, ureter, bladder, or urethra. If the flow of blood only occurs at the beginning of micturition, the lesion is chester. U. Hall probably in the urethra. Where long the Tudor period.

the fluid reaches the bladder, there to clots are observed, the trouble is probe retained for a while until it is dis-charged to the exterior by the ure-thra. It is not known how the U. is formed in the kidneys, though it is probable that the different constitu-ents are secreted in different parts of the 'kidney tubule. The water and some salts are senarated out at the U. Is the trouble is pro-bably in the ureter. Pyuria is a con-dition characterised by the presence of pus in the U. If the U. is alkaline the pus probably originates in the bladder; if acid, pyclitis, or inflam-mation of the pelvis of the kidney, is indicated. Albumen is present in the U. when the kidneys are diseased, and rsion can may be dct. a cougutions before the U. reaches the pelvis lating agent, as nitric acid, to the U. of the kidney. U. as exercted is nor-Sugar may be detected by means of mally a clear amter liquid of sp. gr. Fehling's solution. Its presence is inabout 1.02 and an acid reaction. It is a licative of diabetes mellitus. Bile may a very complex liquid. The bulk of it be present in cases of jaundice, giving is water, in which are dissolved a brownish appearance to the U. Fehling's solution. Its presence is indicative of diabetes mellitus. Bile may a brownish appearance to the U. Among other abnormal aspects of urination are incontinence and retention of U. Incontinence in children is usually a matter of nerves. The micturition-centre is not properly under control, so that the child passes water without its own knowledge. This is dation of the sulphur contained in apt to occur at night, and sometimes many of the proteid substances used as food. The phosphates come partly by the from the food and partly by the fault. He should be encouraged to oxidation of phosphorus-containing substances in the tissues. The most and should not be allowed to drink the structure of the situations.

incontinence In women, incontinence of U. is often an accompaniment of hysteria. Retention of U. is sometimes, like incontinence, of purely nervous origin. Often, however, it is due to obstruction in the urethra, by the impaction of a stone or other cause. The bladder becomes enormously distended and can be felt as a hard ball rising up to the observation. in the abdomen. If the obstruction prc. awn off by an indimondi wa is due to

U. may be drawn off by a catheter. Urin Sotokichi (b. 1857), a Japanese baron and vice-admiral, studied sea-manship in Japan and U.S.A. After holding a number of important posi-tions in the Navy he was in command of the second squadron in the Russo-Japanese War. His chief exploit was the blocknding of Chemulpo, during which he sunk the Russian warships Koreetz and Varyag. He was made a baron in 1907.

paralysis of the bladder and there is

therefore no urethral obstruction, the

Urmia, see Urumiyan. Urmston, a par, and vil. of Lanca-shire, England. 6 m. W.S.W. of Man-chester. U. Hall is a mansion of Pop. (1911) 7915.

Urn, a vase of marble, glass, or clay, | stars used for water, votes at elections, etc., but especially for the ashes of the dead in ancient times. They were of various shapes and patterns and were often beautiful works of art. See Sir Thomas Browne, Urn-burial.

Urodela, see CAUDATA.

Uromastix, see AGAMA Urquahart, David (1805-77), a British diplomatist, born at Brae-langwell, Cromarty, and educated at St. John's College, Oxford, after having spant some time in France and having spent some time in France and Spain. He took part in the Greek War of Independence, and in 1835 was made Secretary to the Legation at Constantinople. He held this position for two years, at the expiration of which he made an extensive tour in the East, with a view to collecting evidence against the policy of Palmerstone. In 1847 he entered parliament in opposition to Palmerston's minisin opposition to Faimerston's ministry. His political publications are numerous, and include: Turkey and its Resources, 1833; Letters and Essays on Russian Aggression, 1853; The Occupation of the Crimea, 1854.

Urquhart, Sir Thomas (1611-60), a Scottish author and translator, educated at King's College Aboutes.

cated at King's College, Aberdeen; his education being completed with the usual continental tour. During the Civil War he fought and underwent imprisonment for Charles I., but of the latter years of his life very little is known. In 1652 he published his 'Exoxyga' apper, better known as The Jewel. In the following year was published the first part of the work that has made his name famous, the translation of Rabelais (Tudor Translations, 1899), one of the most perfect

translations ever made.

Ursa Major (tho Great Bear), the best known of all the constellations, is popularly known as The Waggon (Charles's Wain), the Plough, and, in America, the Dipper. The controllations of the state of the controllations of the state of the st stellation can be found quite easily, for it is never below the horizon in the latitude of Britain. It is a useful guide to finding the Pole Star, the nearest bright star to the celestial pole. This star is found by projecting a line joining the two right hand stars of the seven bright stars which form the stellar framework of the Boan For this reason these two cores. Bear. For this reason these two stars are known as 'the Pointers.' By continuing the sweep of the tail of the Bear (or handle of the Plough or Dipper) the bright star Arcturus (q.v.) is reached, a name by which the Bear has sometimes been called. \(\) Ursæ Majoris (or Mizar), the first recorded double star, is a spectroscopic binary

except Alpha are almost identical.

Ursa Minor (the Little Bear), a small constellation chiefly remark-able for the fact that Polaris (the Pole Star) is situated at the end of its tail. The parallax of Polaris was found by Mr. C. A. F. Peters to be 076, which indicates a distance in light-years

of 42.45. Ursinus, Fulvius (1529-1600), an eminent Italian scholar, born at Rome. He became a priest, and finally succeeded his benefactor, the Canon Gentilio Delfini. He was librarian to two cardinals, and was granted a pension by Pope Gregory XIII. He procured many valuable books and ancient MSS., and formed an archeeological museum. His own works are mainly commentaries on classical authors, e.g. Scriptores Rei Rusticæ, or editions of them, and among his original works is the Familiæ Romanæ.

Urson, the popular generic name of the Canadian tree-porcupines which form the genus Erethizon. It contains

only two species.

Ursula, Saint, of Cologne, is said by the ancient legend to have been put to death at this place some time in the 3rd, 4th, or 5th centuries by the Huns, together with eleven thousand virgins, her companions. Even in the middle ages this popular story was viewed by many with suspicion and it is now universally recognised that the greater part of it is fabulous. There is no certainty, however, as to the origin of the legend.

Ursulines, an order of nuns in the Roman Catholic Church founded about 1537 by Angela da Brescia (c. 1511-40). Its institution was confirmed by Paul III. in 1544, and it was at this time that the order received its present name, from the name of its patron, St. Ursula. The nuns are mainly employed in educational work.

Urticaceæ, an order of dicoty-ledons known to us chiefly because it contains the stinging-nettles. Most of the species are herbaceous or shrubby, have no latex, and often have stinging-hairs; the leaves are usually alternate and stipulate. The perianth consists of from four to five free or united leaves, and the uni-locular ovary contains one ovule. Urtica, Parietaria, and Boehmeria are the chief genera.

Urticaria, see NETTLE-RASH. Uruguay, known locally as the Banda Oriental del Uruguay, a republic in S. America, situated between Brazil and the Argentine, on the Atlantic coast. The surface consists of a level plain traversed in the S. by with a period of 104 days and a of a level plain traversed in the S. by velocity of 100 miles per second. The low ranges of hills and bounded on proper motions of all the principal the N. by mountain ranges, including

the Cuchilla de Haeda and the Cuchilla | 70 m. S.W. of Tabriz. Grande. The chief rivers are the Uruguay and the Negro. U. has a beautiful climate, and therefore the vegetation is very rich. Wheat, oats, barley, maize, linseed, and tobacco are cultivated. Cattle and sheep rearing is, however, the principal occupa-tion, vast herds being reared, and live stock, meat, and wool exported to Brazil, U.S.A., France, and Great Britain. From U., too, is obtained the meat extract used at the Liebig factory, the refuse also being exported as a manure. Lead, copper, manganese, and a little gold and silver are mined. The imports include cotton and woollen goods and machinery. The chief port and capital Monte Video. Transport facilities are good, there being many railroads, tramways, and roads, as well as the rivers, which are navigable for hundreds of miles. The government is vested in a senate, consisting of nineteen members, and a chamber of deputies, chosen by the people in the ratio of one to every three thousand. The one to every three thousand. The president is elected for four years, and the law is based on the Code Napoleon. Education is nominally compulsory, and the revenue is mainly derived from import and export duties. The originalinhabitants were pure Indians. Later the country was held by the Spaniards, forming part of the vice-royalty of Buenos Ayres, while afterwards it came under the dominion of Portugal, and was attached to Brazil. When Brazil declared its independence of Portugal, Portugal strove to retain U., but on the mediation of Great Britain, U. was formally constituted as a republic in 1828. well known, unrest and trouble are constant. Pop. 1,112,000. See R. J. Enoch, Republics of South America, 1913.

Uruguayana, a tn. and fortress of Brazil, on the Uruguay R., in the prov. of Rio Grande do Sul. It is situated on the Itaquy-Quarahy Railway, and is an important centre of commerce. In 1817 the battle deciding the independence of the Uru-guay Republic against the Por guese was fought here, whilst here 1865 Estigarribia surrendered to Emperor of Brazil. Pop. 11,500.

Uruguay River, see PARANA.
Urumia, Urmia, or Daria Shah, a
lake of Persia, in the prov. of Azarhake of Fersia, in the prot. of Azar-baijan, situated in a depression be-tween the mountains at a height of 4500 ft. It is very salt and is fed by the Aji Chai, Jaghatu, Tatan, and Zula. Its outlet is unknown. Its length is about 90 m., breadth 20-30

70 m. S.W. of Tabriz. It is a summer resort, the see of a Nestorian bishop, and is supposed to have been the birthplace of Zoroaster. 50,000.

Urumtsi, or Urumchi (Chinese Tikwa Chou), a tn. of Zungaria, China, 320 m. E.S.E. of Kulja. It is surrounded by double walls and is the headquarters of the Chinese government in Turkestan; it commands the only defile suitable for artillery be-tween Zungaria and E. Turkestan. Pop. 25,000.

Urus, the name applied by the Romans to Bos primigenius, an extinct wild ox, and it is now some-times attached wrongly to the

aurochs. Urville, J. Dumont D' (1790-1842), see DUMONT D'URVILLE.

Usbegs, see Uzbegs.

Usedom, an island belonging to Pomerania, Prussia, and soparating, with Wollin Island, the Pomeranian Haff from the Baltic. Agriculture and fishing are carried on, and the island is popular as a summer resort. The chief towns are Swinemunde (9000) on the R. Swine, and U. (2000) on the S.W. of the island. Area 158

Usertesen, three Egyptian kings belonging to the Twelfth Dynasty (according to the numbering of Userlesen I. Manetho). was second king of the dynasty and his reign is placed by Duncker between 2380 and 2371 B.c. Some scholars place the whole about four hundred years later. He erected obelisks at Heliopolis and Fayum, and carried on hostilities against Nubia and Cush. Usertesen II., grandson of the former, began to reign about 2300 p.c., and continued the campaigns of his grand-father in S. Egypt. The conquest of this part of Nubia was finally com-pleted by Userlesen III. (2221-217) B.C.), the builder of the famous temple at Heracleopolis. See Duncker, History of Antiquity, vol. 1. (Eng. trans. 1877), and Petrie, History of Egypt, 1899.

Uses, in law, the benefit or profit as detached from legal ownership, implies a trust or

in some one for the holding of lands, and all modern conveyances are directly or indirectly founded on the doctrine of U. and trusts, which doctrine has rightly been regarded as the most technical and intricate part of the

doctrine was and was em-

m., and area 1600 sq. m.

Urumiah, Oroomiah, or Urmia, a to evade the statute of mortmain (see tn. in the Persian prov. of Azabaijan, Charitable Trusts; and Mont-

MAIN), and by landowners to evade feudal burdens, or to make land devisable by will at a time when that was impossible by common law (q.v.). The effect of the statute of U., 1535, the object of which was, by executing the use or turning it into the full large terms of the statute of the sta legal estate, to circumvent the above devices, was not what the legislature had hoped; because the courts soon held that only the first and not subsequent uses was executed; hence if A left land 'to B to the use of C to the use of D,' C had the legal but D the beneficial ownership. judicial decisions defeated the main policy of the statute, and restored U. under the now more familiar name of unuer the now more lamiliar name of trusts, and hence brought about the whole modern system of 'equitable estates.' If land be conveyed to A to the use of B, B has the possession vested in him; but if the conveyance be to A, to the use B in trust to perfect of the conveyance beto A, to the use B in trust to perfect the state of the E. mit C to enjoy the profits. B has the legal, but C the equilable, estate (q.v.). U. apply only to lands of inheritance and therefore are inapplicable to leaseholds. Springing use is one limited to arise on a future event where no preceding use is limited. For example, if A seised in fee grants to B upon A's own marriage to hold to the use of A for life with remainder to A's first and other sons in tail,' life estates and remainders 'spring' up by way of use on the event of A marrying (see Settlement). Shifting use is one which, though executed, may change or shift over to another person by circumstances. For example, if A grants 'to B upon A's own death to hold to the use of C, and his heirs, but if C do not within three years take the name and arms of A, then to use of D and his heirs. the land goes to D if C does not fulfil the condition mentioned. Contingent use or remainder is one limited (see LIMITATION) to a person not ascer-tained, or upon an uncertain event but without derogation of a prior U. Resulting use is one which expires or cannot vest, and therefore is said to result or return to him (or his heirs) who created it.

Ushak.

who created it.

Ushak, a tn. of Turkey in Asia, in
the vilayet of Brusa, 55 m. N.E. of
Alashehr, and connected by rail with
Smyrna and Koma. It is famous
for pile-carpet weaving. Pop. 15,000.
Ushant (Fr. Ouessant), an island in
the dept. of Finistère, France, 27 m.
N.W. of Brest. It has steep coasts,
with a fartile soil. flehing is the objet

with a fertile soil; fishing is the chief industry, and the small port of Ouessant on the S.W. is the only town. There are two lighthouses and a telegraph station. Area 20 sq. m.; Pop. 3000. There were two battles fought

first was between the French under D'Orvilliers and the English under Keppel in 1778 and was indecisive. The second was fought the 'glorious first of June, 1794,' when Admiral Lord Howe gained a great victory over the French under Villaret-Joyeuse, capturing seven vessels.

Ushas, the Hindu goddess of the wn to whom beautiful Vedic dawn to hymns are addressed. She is the life and breath of all things. She is born afresh each day, and has ruddy steeds yoked to her shining car.

Usher (or Ussher), James (1581-1656), an Anglican theologian, prelate; and scholar, born in Dublin and educated at Trinity College, Dublin, where he took the degree of M.A. in In 1603 he was made chan-of St. Patrick's Cathedral. 1600. cellor Dublin, and from 1607-20 was regius professor of divinity at Trinity College. In the latter year he became Bishop of Meath, and in 1624 archbishop of Armagh and primate of Ire-He sided with Charles I. during the civil war, consequently losing much of his property in Ireland. He was preacher to the Society of Lin-coln's Inn from 1647 until just before his death. His scholarship was great and his Annales Veteris et Novi Testa-menti proposed a scheme of biblical chronology universally accepted at the time.

Usk, a par. and market tn. of Monmouthshire, England, situated on the G.W.R. 61 m. E. of Pontypool and 12 m. S.W. of Monmouth. There is an old castle, and the church was originally attached to a 13th-century Benedictine numbery. Pop. 1600.

Usk, a riv. of Brecknock and Monmouth, flowing S.E. into the Bristol Channel at Newport. It has a le of 37 m. and is noted for salmon. It has a length

Usk, Thomas (b. 1388), the author of The Testament of Love, an important prose work formerly ascribed to Chaucer, was born in London. was the principal witness against John de Northampton in 1384, and in 1388 was executed by order of the Merciless Parliament. The Testament of Love, apart from its historical and philological interest, has no literary merit. Wilhelm Hertzberg in 1866 proved that it was not written by Chaucer.

Usnea, a genus of lichens, typical of the family Usneacee, found growing on rocks and trees of cool countries. U. barbata is the tree-moss, beard-moss, hanging-moss, or necklace-moss.

Uspallata, the name of a pass in the Andes, between the Argentine Republic and Chile. It is situated in 3000. There were two battles fought lat. 32° 50′ S., and is about 12,800 ft. off Cape U. in the 18th century. The high at the highest point. The Trans-

· mentioned, vations in

for traffic in April 1910, runs through

Ussing, Johan Ludwig (1820-1905), Danish archæologist and philo-He travelled in Italy and (1844-46), and was professor of classical philology and archeology at Copenhagen (1849-95). His His publications include: Graca inedita, 1847; tiones tres de lege agra

Andine Railway, which was opened for traffic in April 1910, runs through this pass.

Wasatch Mts. (highest peak Timbungos, 11,957 ft.) shut off the western section, which belongs to the Great Basin of the continent, and consists of highlands running N. to S. separated by valleys of desert wastes from the eastern, which belongs to the Colorado basin, and is remarkable for its lofty plateaus through which `~ir ~passage. an offshoot

terricht bei den Gricchen

Betragtninger over Vitruvii de archi-

Ussing, Tage Algreen (1797-1872), a Danish radical statesman and jurist, born in Zealand. He became assessor to the High Court, and urged the union of the duchies of Schleswig and Holstein to Denmark at the Roskilde meeting (1844). He was councillor of state (1846 and 1854-66), deputy from Copenhagen to the 56), deputy from Copenhagen to the Diet (since 1834), and procurator-general of Denmark (1848). U. was the author of Laeren om Servituter, 1836; Haandbog i den Danske Arveret, 1855; and Haandbog i den Danske Criminalret, 1859.

Usufruct, in Roman law, the temporary and a priory part of londer of the denomination of the contract of londer of the denomination of the contract of the con

porary use and enjoyment of lands or tenements, or the right of receiving the fruits and profits of lands or personal property belonging to another, without having the right to alienate or change the corpus or property itself. The usufructuary's rights when in the nature of personal as opposed to predial servitudes, necessarily subsisted only so long as the substance of the thing used

remained unimpaired.

Usulatan, a tn. of Salvador, Central America, situated about 70 m. S.E. by E. of that city.

Usury, formerly denoted any legal interest for the use of money, but in present usage denotes only illegal or excessive interest. By an Act of 1714 the legal interest in England was fixed at 5 per cent., and all contracts made for the payment of any principal to be lent on usury above that rate were null and void. The legislature has now abandoned the policy of fixing a limit. Where, how-ever, interest is recoverable on a contract, 5 per cent. is usually, though not invariably, the rate allowed by the court. See also Inallowed by the court. A

Danish 1863-65, German 1885; and is one of extremes. Every attempt is being made to reclaim the vast tracts of unfertile soil by irrigation. chief crops are wheat, oats, potatoes, onici crops are where, oats, poatous, and hay, but the growth of nursery produce and fruits is now encouraged. Cattle raising engrosses much attention. Copper, and after that silver, lead, and gold are the most valuable minerals. The manufacture of flour and of railway cars, and also printing, are the chief industries, but there are copper and lead smelting works and copper and lead smelting works and bect sugar factories. U. was coded by Mexico to the states in 1848. It has been colonised by Mormons. The capital is Salt Lake City, situated on Great Salt Lake in the N. Area 84,990 sq. m. Pop. (1910) 378,351.

Utakamand, or Ootacamund, a reministration of the dist.

municipality and tn. in the dist. of Mulgiri Hills, Madras Presidency, British India, 36 m. N.N.W. of Coimbatoro. It is pleasantly situated at a height of some 7000 ft. above the sea, and is the principal sanatorium and summer resort of the presidency. The Lawrence Asylum, the botanical gardens, Hobart Park, recreation grounds, and government cinchona plantations are the chief features of the town, in addition to the large artificial lake (11 m. in length). Pop.

20,000. Utamaro (1754-1806), a Japanese artist of the Ukiyoo school, known chiefly by his coloured wood-cuts, born at Yedo; he was the son of a painter of distinction. Toriyama Sekiyen. While still a boy he mani-fested a taste for dissipation, and, being disowned by his father in consequence, he went to live with a famous print-seller, Tsutaya, and thenceforth his life was mainly devoted to depicting the beauties of the Yoshiwara, while he also issued a series of drawings of insects. His work gradually became very popular, his fame penetrating even to China; but in 1804 he issued a print libelling Utah, an almost rectangular state but in 1804 he issued a print libeling belonging, since 1896, to the American Union and confined by Nevada (W.), Idaho and Wyoming (N.), U. was probably the first Japanese Colorado (E.), and Arizona (S.). The lartist to become well known in

Dutch merchants resident at Nagasaki. As a draughtsman he has few rivals even among the greatest masters, his lines invariably reflecting inimitable grace and rhythm, while as a colourist he holds an equally high place, almost everything from his hand enshrining the most subtle See Ricketts, and delicate tints. Pages on Art (London, 1913); Life, by Edmond de Goncourt (Paris, ī891).

Uterus, or Womb, the organ in which the development of the ovum takes place. It is a pear-shaped organ, flattened and about 3 in. long in the non-pregnant condition. Its position is between the bladder and the rectum, with the base directed forwards and upwards; the cylindrical neck or cervix is directed towards the vagina, with which it communicates by the os uteri externum. This orifice is small and elliptical in the virgin, but after pregnancy pregnancy The wide remains much wider. The wide portion, or fundus, of the U. receives the Fallopian tubes at its two upper angles. The fundus is triangular in form, the apex being a constriction called the os uteri internum leading to the cervix. The walls of the U. consist of mucous membrane as its inner surface continuous with that of the vagina, a thick layer of muscular tissue, and an outer surface of peritoneum. The peritoneum is reflected onteum. The personeum is renected outward to the wall of the pelvis and forms a means of suspension for the organ. This arrangement not only provides for a great degree of mobility, but also allows for considerable distension in pregnancy. During able distension in pregnancy. During the period of sexual activity, from puberty to the menopause, the U. discharges about 6 ozs. of blood and mucus at intervals of twenty-eight or thirty days. The chief function of the U. is, however, the development of the fertilised ovum. The ova are carried from the ovary to the U. by way of the Fallopian tubes. After the ovum has been fertilised, it dethe ovum has been fertilised, it depends for the nourishment necessary for development on the U., which is furnished with structures adapted to that end and for carrying away the waste products of the fœtus. The U. is the seat of many disorders which are dealt with in that branch of medicine known as gynecology. Owing to its mobile situation, the organ is subject to many varieties of displacement. Flexion, whether an

Europe, many of his prints being presence of a polypus. Prolapse sent there during his lifetime by occurs when the U. is engulfed into the vagina; it may even protrude through the vulva. After being replaced by the fingers it should be kept in position by a pessary. Inflammation of the mucous lining of the U. is called endometritis. It is due to the extension of infective inflammation from other structures, or to sepsis following the expulsion of the fœtus. Treatment consists of irrigation with antiseptic fluids, with care of the general health. The U. is a very common seat of tumours, both benign and malignant. Fibroids or myomata may persist for years with-out giving indications of bad health. On the other hand, they may cause sterility or lead to excessive hæmorr-hage. Cancer of the U. is most common towards the climacteric common towards the chinacteric period. Hemorrhage or enlargement may indicate the existence of a growth. Surgical treatment at an early period of the disease often leads to a cure.

Utica, an ancient city of N. Africa, situated 25 m. N.W. of Carthage in the present dist. of Tunis. It was founded by the Phænicians in 1101 B.C., and after the destruction of Carthage (146 B.C.) rose to be the first city of Africa, and capital of the Roman province.

Roman province.

Roman province.

Utica, a city and cap. of Oneida co.,
New York, U.S.A., situated on the
R. Mohawk and the Eric Canal, 83 m.
W.N.W. of Albany. It is a railway
and canal centre, and has manufs. of
cotton goods, hosiery, engines, etc.,
iron and brass castings, fire-bricks,
boots and shoes, etc. Fort Schuyler,
on the site of which U. is built, was
built in 1758. Pop. 62,000.

Utilitarianism may be summarised

Utilitarianism may be summarised by its own catch-phrase, 'the greatest happiness of the greatest number, such happiness being the criterion of ethical right and wrong, and pleasure and freedom from pain the only de-sirable ends of life. Although the term originated with Bentham as a purely philosophical and political expression, the theological line be-ginning with Bishop Cumberland, in-cluding John Gay and Abraham Tucker, and ending with Paley, had already covered the same ground from the purely ethical point of view, identifying happiness with virtue. U. proper began with Bentham, whose Principles of Morals and Legislationmust be regarded as the origin of the movement which culminated in John Stuart Mill. J. S. Mill defined U. on excessive bending forward or a more broadly sympathetic and less reversal of the normal flexion, leads selfish lines than Paley and Bentham, to difficulties of menstruation and possible sterility. Inversion is caused foundation of morals utility, or the by difficult parturition or by the greatest happiness principle, holds

that actions are right in proportion as they tend to promote happiness, wrong as they tend to produce the reverse of happiness. Morality, he consists in conscientious says, considered on biological or evolutionary grounds, was pointed out in Darwin's Descent of Man, and followed up by Herbert Spencer and Sir Leslie Stephen. The name of Henry Sidgwick must also be men

Bladde: wo the follow-creatures: A new aspect of U., considered on biological or evolutionary grounds, was pointed out in Darwin's Descent of Man, and followed up by Herbert Spencer and Sir Leslie Stephen. The name of Henry Sidgwick must also be men

Bladde: wo Uttersen, a tn. of Schleswig-Holstein, on the N. R. Rinnau, 17 m. N.W. by W. of Hamburg. Pop. 5500.

Uttoxeter, a tn. of Staffordshire. England, situated 12 m. N.E. of Stafford Hardware manuf. is carried on Pop. 5500.

Thomas (1782-1857), an artist, born in London, and there. He became an exhibitor of the 'Old Water-Society in 1809, and in 1813.

In 1817 he travelled

doctrine of U. Utopia (nowhere; Gk. ov, not, and rómos, place) was the name given by Sir Thomas More to the imaginary island described in his De Optimo Reipublica Statu, deque Nova Insula Utopia, published in Latin in 1616, and translated in 1551, by R. Robinson. This romance speedily attained considerable popularity, and from it the adjective Utopian has been formed to mean 'impracticable,' or 'ideal,' particularly as applied to schemes for

improving social conditions. Utrecht: 1. A tn. of Natal, S. Africa, situated 135 m. N. of Pietermaritzburg. Fruit growing is carried on, and coal has been found. The town is the capital of the district of Utrecht, which was annexed to Natal in 1903. which was annexed to Natal in 1903. Pop. 5000. 2. A prov. of the Netherlands, bounded by N. Holland, the Zuyder Zee, Gelderland, and S. Holland. The soil is sandy and sterile in the E., but more fertile in the W. Area 534 square miles. Pop. 280,000. 3. The cap. of the prov. of Utrecht, is situated on the Old Rhine, 35 m. E. of the Hague. It is the seat of a Roman Catholic and of the Old Catholic archbishoprics. Among the principal buildings are the remains of the cathedral (damaged by a hurricane in 1674), the Uniby a hurricane in 1674), the University (founded 1633), and an archiepiscopal museum. The chief manufs are cloth, woollen goods, silk, carpets, nottery, organs, chemical products, needles, salt, gin, etc. U. is very ancient, being known to the Romans ancient, being known to the Romans as Trajertus ad Rhenum; it was the residence of the powerful prince-bishops of the 8th century and after, and also of the German emperors. The Treaty of Utrecht (1713) was signed here, ending the War of the Spanish Succession. Pop. 110,000.

exhibitor of the 'Uid WaterSociety in 1809, and in 1813
it exposition, in France, and in 1824 went to Italy
for seven years. He was elected an
associate of the Royal Academy in
1833, and a member in 1838. In 1844
he was made librarian of the Royal
Academy in 1845 surveyor of pictures Academy, in 1845 surveyor of pictures to the queen, and in 1847 keeper of the National Gallery.

Uvula: 1. A small cone-shaped hanging process suspended from the middle of the lower border of the soft palate. It is formed by the azygos uvule, levator palati and tensor palati muscles, mucous membrane, and connective tissue. 2. A small offshoot of the inferior vermis of the cerebellum, constituting the posterior limit of the fourth ventricle. slight elevation of mucous membrane projecting from the anterior and lower part of the bladder to the urethral orifice. This is known as the uvula vesicæ.

Uxbridge, a par. and market tn. of Middlesex, England, situated on the R. Colne, 18 m. N.W. of London. Brewing, brick-making, iron-founding, and market gardoning are carried on. Here in 1645 the unsuccessful negotiations between parliamenta-rians and royalists took place. Pop. 9000.

Uzbegs, or Usbegs, form a branch of the Turkish family of Tartars. They are supposed to be of Uigur origin, descended from a tribe which migrated from Kashgaria to Western Turkestan. Their blood is mixed in different localities with Aryan, Kipt-

V, as pronounced by the English, is the pressed or medial labial aspirate, bearing the same relation to f that bIts form is only a variety does to n. of the character by which the vowel U is denoted, the latter being in its origin the cursive character employed with soft materials, while V is better adapted for writing on stone. The Roman letter U was probably pronounced as a w, a supposition which would explain the fact that in the alphabet of that language one character is employed for both u and ∇ . The converse of this appears in the German alphabet, where w has nearly the power of v, while the latter symbol is used to designate the sound of the English f. \forall is interchangeable with b and m. It is also interchange

able with f, and hence the confusion between the characters f, v, and w.
Vaal, a riv. of S. Africa, trib. of the Orange R., which rises in Mt. Klipstapel, flows W. and S.W., separating the Orange Free State from the Transvaal, and crosses Griqualand W. A weir 1100 yds. long has been made across it at Parys for the purpose of irrigating about 2000 acres of land. Important diamond diggings are in and near the bed of this river.

Vaals, a vil. of the Netherlands,

4 m. from Aix-la-Chapelle, with

manufactures of cloth. Pop. 7514.

Vaccinaceæ, a natural order of small shrubby plants with bellshaped flowers followed by juicy acid berries, among which are the cranberry and whortleberry or bilberry.

Vaccination, the inoculation with cow-pox in order to afford protection against small-pox. The idea of vaccination first occurred to Dr. Edward (1749-1823) in connection Jenner with a belief, popular in his native county of Gloucester, that persons affected with cow-pox were thereby rendered immune from small-pox. His views met with opposition among medical men of the best reputation, and it was not until 1798 that he succeeded in demonstrating that vac-cinated subjects were immune, at least for a time. V. was made compulsory in Bavaria in 1807, Denmark in 1810, Sweden in 1814, Prussia in 1835. United Kingdom in 1853, and U.S.A. but many of the states enter to be vaccinated, or inspected after force it. It is claimed that the decrease in the incidence and in the vaccination, should be liable to ercase in the incidence and in the provision met the above-noted dispersion of small-pox is due to the

A most cogent fact is practice of V. that whereas small-pox was formerly a disease more especially of childhood, the young and therefore freshly vaccinated have been seldom attacked in recent epidemics. Again, hospital attendants and medical men who are re-vaccinated at intervals have not been known to contract the disease. The opponents of V., besides resisting the interpretation that V. is the main factor in the diminution of small-pox cases, point to the fact that erysinelas and even syphilis have been caused or communicated by cow-pox inocu-Now that the use of glycerinated calf lymph is general, the danger of syphilis is obviated, and it is generally conceded that the marked good effects produced by the general practice of V. more than compensate for the remarkably few cases in which the inoculation terminates unfortunately. The law of England now requires parents to procure the V. of their children within six months from birth, unless they have, within four months of birth, satisfied a court of petty sessions that they have a conscientious belief that such V. will be injurious to the health of the child.

Vaccination Acts. The first Vaccinais, tion Act, passed in 1840, provided the means of vaccination, at the public cost, for every person in the United of Kingdom, but left it purely optional whether he should avail himself of his statutory advantages. The next Act, that of 1853, made vaccination compulsory in England, and in 1861 LawGuardians Poor authorised to appoint persons to initiate and conduct proceedings for the purpose of enforcing obedience to the Vaccination Acts. A technical difficulty in enforcing soonarose penalties for disobedience parents who, having been fined, persisted in refusing to have their children vaccinated and then availed themselves of the time-honoured themselves of the time-honoured legal principle that no one can be punished twice for the same offence. The result was that in 1867 the Vaccination Acts were repealed by the Act of that year. The chief amending provisions of this Act provided that a parent, or person having the German Empire in 1874. There the custody of a child, who neglected is no federal law compelling V, in the without reasonable excuse to take it

parent might be convicted and fined over and over again so long as he remained contumacious. There ensued, as usual, widespread opposition to the Act, or rather to the principle of compulsory vaccination, which opposition continued with varying phases of fortune even after the passing of the Act of 1898, which recognised the counter principle of conscientious objection. In the meantime the Consolidating and Amending Act of 1871 was passed. The principal amending provisions of the Act are those which empower the Local Government Board to make regulations for carrying out the Vaccination Acts, and punish persons who sign false certificates of unfitness of children for vaccination, or who refuse to permit the vaccinator to ascertain the result of the vaccination, and empower a Poor Law medical officer, when attending a small-pox patient, to vaccinate and re-vaccinate any person resident in the same house. In 1888 an order of the Local Government Board was issued reducing the age limit for re-vaccination from fifteen to twelve years in ordinary circumstances, and ten years when there was danger of small-pox. 1889 a Royal Commission was appointed to inquire, among other things, into the effect of vaccination in reducing the prevalence of, and mortality from, small-pox, what other means there were for diminishing the disease, and the nature and extent of the alleged injurious effects of vaccination. The report of the Commission was on the whole against the ontentions of the anti-vaccinators; the toxins by substances called anti-but in 1898 Mr. Chaplin, then presi-dent of the Local Government Board, bull is some obscure way, under the introduced an amending bill i House of Commons. The m portant provisions of this Act v extension of the age period of v tion to six months after bir..., substitution of glycerinated calf lymph for arm-to-arm vaccination or humanised lymph, and, above all, the admission of the new principle that a parent who conscientiously 'objected' should escape the penalty for omission to vaccinate by delivering to the district vaccination officer a certificate, signed by two justices, a stipendiary or metropolitan police

lemma, for the High Court held in small measure to the Act of 1898. the case of Allen v. Worthy that a Another result of the Act was the tremendous increase in the cost of public vaccination. Anti-vaccina-tion leagues continued to be formed in spite of the Act of 1898, by reason, mainly, of the fact that justices were not readily inclined to be satisfied of the conscientiousness be satisfied of the consciencious of the objectors, and eventually, in 1907, the last Vaccination Act was passed. This provided that the conscientious objector should make a statutory declaration within four months of the birth of the child of his objection, and send such declaration within seven days by post to the district vaccination officer.

Vaccine-therapy, a method of curing infective diseases by inoculation with the virus of the causative microorganisms. The theory owes its origin to Dr. Jenner's discovery of vaccination in the restricted sense; that is, the inoculation of healthy persons with cow-pox in order to

of . . . but patients have been inoculated while they are ac disease, and

up to the pr

· olved in bacmainly upon s or bacterial poisons, which in some cases are extremely virulent. The disease is fought in normal cases by the destruction of bacteria—a work in which the white corpuseles are especially engaged—and by the neutralisation of the toxins by substances called anti-

the injected serum contains, not bacteria, but only the anti-toxic sub-stances elaborated by the horse or other animal inoculated with the disease. V., on the other hand, involves the

magistrate, of his conscientious objection. The Bill was passed on Aug. 12, 1898, and though made experience it that is, it makes them more susmental for five years, has always been coptible to destruction by the white renewed by the Expiring Laws Con-tinuance Acts. In 1901-2 small-pox of disease the opsonic power of the once more became epidemic in the patient's serum is compared with United Kingdom, and there can be that of normal serum, the result being little doubt that this was due in no a ratio which is called the opsonic

В

index. The fluctuations in the opsolic index afford a valuable indication as to whether the injection of a vaccine is likely to aid in conquering carried down to B where they escape the disease or not. When the opsonic at the surface of the carried down to B where they escape the disease or not. index is rising (positive phase), it is an indication of increased immunity,

which can be still further increased by the stimulus afforded by the injection of a dead culture of the micro-organ-When the opsonic index is falling (negative phase), the injections discontinued. Vaccines been used for typhoid fever, asthma, septicæmia, and local lesions caused by streptococci, pneumonia, Malta fever, etc. In most cases the results have been much more successful than serum treatment; although in diphtheria, for example, the protection afforded by antidiphtheritic serum has not been improved upon. Vac-cines derived from the patient's own bacteria are the most useful; but it is not always practicable to prepare them, so that 'stock' vaccines are often used instead. See Vaccineoften used instead. See Vaccine-therapy: its Administration, Value, and Limitations (Proc. Roy. Soc. Med., Oct., 1910).

Vacherot, (1809-97),Etienne philosophical French writer and statesman; became professor of philosophy at the Sorbonne in 1839, but was obliged to resign for refusing to take the oath, 1852. His two most important works are: L'Histoire critique de l'Ecole d'Alexandrie, and La Métaphysique et la Science

Vacquerie, Auguste (1819-95), French author and journalist; was born at Villequier, and became a great friend of Victor Hugo. His first literary work was L'Enfer de l'Esprit, a collection of poems. He afterwards contributed to Evénement, and wrote several comedies, including: Souvent Homme varie; Jean Baudry, and Le Fils. Other works are: Les Funérailles de l'Honneur, a drama; and Futura, a philosophical poem.

Vacuum, in physics, denotes a space which is perfectly free of matter, i.e. of solid, liquid, or gas. It is, perhaps, impossible to produce a perfect vacuum; for in the vacuum produced by an air pump, however far the ex-haustion may be continued, there is always some air left in a more or less rarefied state. High vacua are generally produced by means of mercurial pumps, chief among these being the Sprengel pump. The prin-

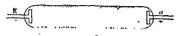
mercury. If T is closed, the mercury rises in the tube and thus prevents a reflux of the air. The limit of haustion is that of perfect T nearly \mathbf{a} vacuum, providing the distance VB is the greater than height of the merbarometer. curial The application of liquefied gases of a very low boiling point lsutilised with great success in this connection. effects the conden-sation of the gas contained in the in the contained The vessel vessel. is attached to a tube which is surrounded by the liquefied gas; the gas in the vessel to be exhausted condenses in this tube, which is then sealed off. High vacua are measured generally by observing character of an discharge electric

through them (see VACUUM TUBES)

or by the M'Leod gauge.

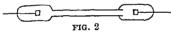
Vacuum Engines are small engines capable of generating power varying from one-fifteenth to one-half of a horse - power. The principle which underlies their working is the creating of a partial vacuum in the cylinder containing the piston, and thus allowing the atmospheric pressure to give the necessary impulse to the piston. The partial vacuum is commonly produced by means of a flame which is drawn into the cylinder during the outward stroke of the piston. This outward service of one passon. This flame heats the gases inside the cylinder, some of the gas necessarily escaping through a suitable valve. By suitable valve arrangements the flame burns out before the return stroke of the piston. The cylinder is water-jacketed and thus the hot gases in the cylinder are cooled. This effects ciple of the pump may be explained a partial vacuum, and the atmobyreference to the figure. Its essential parts are: the reservoir R containing mercury, the vertical tube connected to R by the tap T, and the tube V let into the side. B is a cup, in which the tube dips under mercury. As T is opened the mercury falls down the might be inferred from this sketch. in the cylinder are cooled. This effects a partial vacuum, and the atmospheric pressure which acts on the exposed part of the piston pushes it into the cylinder. This operation and impulse are repeated for each revolution of the engine, which is far more complicated in its mechanism than might be integrated from this cleak.

be consulted. Vacuum Tubes. If the brass terminals of a Wimshurst machine be brought near to one another during the working of the machine, the machine discharges itself by means of a spark across the air gap separating the two brass knobs, the frequency of the spark depending on the distance between the knobs. If an electrical discharge takes place through a rarefied gas, the character of the discharge is somewhat more complicated, depending on the degree of exhaustion of the tube which con-tains the rarefied gas. Such a tube is given in Fig. 1, the two terminals k



and a being fused through the glass, the tube being exhausted by means

of an air pump. Geissler tubes are V. T. having a shape as shown in Fig. 2. As the degree of exhaustion increases, the following changes in the character of the discharge occur.



Firstly, the tube is filled with a luminous column of a crimson colour, which extends the whole distance between the electrodes k and a. Secondly, the crimson colour disappears, the column splits up into luminous strie (Fig. 1), and a dark space, called Faraday's dark space, expect the kathode k which is appears near the kathode k, which is covered with a luminous glow. a later stage the strice become thicker and the Faraday space becomes less distinct. The luminous glow separates from the kathodes and gives rise to another dark space, Crookes dark space, around the kathode. At a higher degree of exhaustion the glow totally disappears and the tube is filled with the Crookes dark space, the surface of the glass tube becoming phosphorescent. Further exhaustion increases the resistance so much that

examina Acts. believ becaust, in the highly rays, fied gardonarticles of matter katho rarefled charged

For further details a text-book should | were shot off from the neighbourhood of the kathode with a very great velocity. The phosphorescence is caused by the impact of these par-ticles on the sides of the tubes. This may be shown by inserting some obstruction in the path of the rays inside the tube. A shadow of the obstruction will be cast on the side of the tube, showing that the part en veloped in the shadow is free from the impact of the rays. Sir J. J. Thomson has shown conclusively that these rays consist of a stream of negatively electrified particles. that the stream can be deflected by means of a magnet or by means of an electric field. By measuring the deflection produced in both these cases, Thomson obtained the velocity of the particles and the ratio of the mass of a particle to the charge on it. Later investigation by Thomson showed that the mass of an electron (one of the above particles) was 10 27 gram.

or 745 part of a hydrogen atom. Positively charged ions.—Wien has shown the existence of positively charged particles, which he obtained by means of a perforated kathode. These positively charged particles may be observed as luminous rays proceeding from the perforations at the back of the kathode. The mass of these ions appears to be that of the atom of ordinary matter, and their velocity is about 3.6×10, cms. per

Lenard rays.-Lenard showed that the kathode rays could be trans. mitted through the walls of the V. T.
This was done by perforating the
wall and covering the perforation
with a thin plate of aluminium. The rays which strike against this plate can be detected outside the tube for a short distance. When outside the tube, the rays are known as Lenard rays, but as kathode rays when inside to the the tul

second.

vs that size of 1 with they n atoms . riment has confirmed to some extent the view that atoms are but aggregations of these small particles which

are called electrons.

Röntgen or X-rays.—These were discovered by Prof. Röntgen in 1895. nceases the resistance so much that discharge only takes place with difficulte, and the the exhibition of the concentration of the conc Acts. type of discharge, of radiation which he termed 'Xbecaust, in the highly rays.' Röntgen found that if the gradouarticles of matter with regative electricity or any plate in the tube, this radia-

opaque to light. The degree of absorption of the rays depends on the density of the substance; the denser the substance, the more rays were absorbed. Thus metal or bone absorbs the rays more fully than does leather or flesh, and Röntgen easily succeeded in photographing coins in his purse and the bones in his hand. The rays produce phosphorescence on screens of platino-cyanide and similar salts, and by using these plates invisible objects may be made visible. The nature of the rays has not yet been fully established. The photographic effects and fluorescence suggested that they were ordinary ether waves, similar to light waves. These rays cannot be refracted, and only recently and with very great difficulty they have been shown to be capable of polarisation. Further, the rays are not affected by a magnetic or electric field of force, showing that they are not moving electrified particles. Sir George Stokes has suggested that the rays are single pulses travelling through the ether, i.e., electromagnetic impulses such as would be produced by the sudden stoppage of a moving electrified particle (for medical application see X-RAYS).

of gases. - Generally Ionisation speaking, all gases are good insulators, as may be seen from the fact that an electrified body suspended in the air will lose its charge very slowly, provided there is no leakage in the supports. If X-rays are passed through the air surrounding a charged electroscope, the instrument becomes rapidly discharged, showing an in-crease in the conductivity of the air. crease in the conductivity of the air. This conductivity may be produced under the action of the Kathode, Lenard, or X-rays, by radiations from radio-active substances and by means of a flame. Thus the air or gas has obtained a new property which it does not readily lose. This new property is explained by the presence of charged particles similar in character to the ions in an electrolyte. In electrolytes these ions are permanent, but in gases some ionising agent is necessary. Gaseous ions are easily removed by contact with solids or liquids, or by the action of an electric field. In the absence of these processes, the ions gradually disappear spontaneously because of recombination of the ions possessing opposite charges to form the original atoms. The velocities of these positive and negative ions were determined by Rutherford. He obtained the sum of

tion was produced, and it was capable cannot be determined from this of penetrating many substances result, but the ratio of the velocities determined by Hittorf combined with the results of Rutherford is sufficient to give the velocities of each Zeheny measured these veloion. Zenery measured these velo-cities by passing a stream of gas along a tube, and measured the distance the stream carried an ion forward. His results showed that in dry air the velocities in cms. per second per volt per cm. were 1.36 for the positive ion and 1.87 for the negative ion, and found generally that the velocity of the negative ion was greater than that of the positive ion. See Sir J. J. Thomson, Conduction of Electricity through Gases, 1903; Rutherford, Radio-Activity, 1905; Lodge's Electrons.

Vacz (Ger. Wailzer), a tn. in Hungary, on the l. b. of the Danube, 25 m. N. of Pesth. V. is the seat of a bishopric, and has an episcopal school.

a gymnasium, and a school for deaf mutes. Pop. 18,000. Vadstena, or Wadstena, a tm. of Sweden on the E. shore of Lake Wetter, with a 16th-century castle. It is a centre of the lace-making industry. Pop. 2548.

Vaga, Perino Del, or more properly, Pietro Buonaccorsi (1500-47), an Ita-lian painter, born in Florence. He helped Raphael in the frescoes of the Vatican at Rome, and after his death went to Genoa and founded a school of painting. The 'Creation of Eve' in the church of Marcello in Rome is a good example of his work. Vagabond, see VAGRANTS.

Vagrants. Under the comprehensive term V., the law includes a vast number of petty offenders or persons suspected of contemplating the commission of some offence, there being practically nothing in the shape of a common factor underlying the various types of V. The whole law is now to be found in the Vagrancy Act, 1824, and the different amending Acts. Under these Acts V. are classified into: (1) Idle and disorderly persons, (2) rogues and vagabonds, and (3) incorrigible rogues. The first category are the following: persons who fraudulently apply at a workhouse or to any Poor Law officer for relief (having at the time property in their possession or control without making a complete disclosure of such pro-perty to the overseer or relieving officer); prostitutes behaving in-decently in places of public resort; persons who although able to maintain themselves or their family by work or other means wilfully neglect to do so, thereby becoming or causing his dependents to become the ionic mobilities of different gases. chargeable to the parish; pedlars The velocities of the separate ions trading without a licence; persons

wandering abroad or loafing about mitting offences under the Aliens Act. any public place, street, court, or passage to beg alms, or causing or en-couraging any child to do so; persons returning to and becoming charge-able to any parish from which they have been legally removed under an order of justices except with a certificate of an overseer acknowledging them to be settled in another parish (see under Poor Laws); and women who neglect to maintain a bastard child when able wholly or in part to The punishment of idle and do so. disorderly persons is imprisonment, if committed by one justice, for a term not exceeding fourteen days with hard labour, or, if committed by two justices, one month, or as an alternative a fine not exceeding £5 (but hard labour must not be awarded for default of payment). In the class of rogues and vagabonds are included persons convicted for a second time of an offence which if it had been the first occasion would have constituted them idle and disorderly persons; fortune tellers; persons wandering about and lodging in barns, out-houses, or other deserted buildings, or in the open air, without visible means of subsistence and without giving a good account of themselves; persons exposing to view in any shop, road, or public place, any obscene print or or public place, any obscene print or picture; persons obscenely and wilfully exposing their persons in a public place; persons who endeavour by the exposure of wounds or deformities to obtain alms, or who in any way by false pretences try to get charitable contributions; persons propring a ware or and leaving a ware or running away and leaving a wife or child chargeable to a parish (this apparently includes only legitimate children); women convicted of a second offence of neglecting to maintain their bastard children whereby such children become chargeable to a parish; persons gaming in a public place (including a railway carriage); place (including a railway carriage);
male persons living on the carnings
of prostitutes; persons who persistently solicit in any public place
for immoral purposes; persons who
make false confessions of desertions
from the navy, or false statements in
order to get into the navy; persons
armed with offensive weapons with
intent to commit felony; persons
found in any dwelling-house, stable. intent to commit felony; persons found in any dwelling house, stable, enclosed garden, or yard for any un-lawful purpose (this means for the purpose of committing some offence centuries, who gave himself out to be which would, if effected, render the an incarnation of Krishna, and died which would, if effected, render the an incurrence offender liable to a criminal prosecu- at Benarcs.

tion, and not an act of mere im- Valais (Ger. Wallis), a cauton of morality); reputed thieves or stretching from Mt. de Balme, The canton and de Balme, The canton and frequenting any river, canal street, or highway with it commit a felony; and perso....

1905. The punishment of rogues and vagabonds is either fourteen days' imprisonment with hard labour or three months' imprisonment, according to whether the conviction is before one or two justices, or a fine of £25. The class of incorrigible rogues includes persons convicted a second time as rogues and vagabonds, and V. breaking out of legal confinement. The punishment may extend to one year's imprisonment to which whipping (in the case of males) may be superseded. Offenders included in Classes I. and

offenders included in Classes I. and II. may appeal to Quarter Sessions. Offenders of Class III. may appeal from Quarter Sessions to the Court of Criminal Appeal.

Vahl, Martin (1749-1804), a Norwegian botanist, born at Bergen. He studied under Linneus, and, having spent some time in travel in Europe and Africa became professor of Africa, became professor of natural history and later professor of botany and inspector of the botanic Ecloge Americance, 1796-1807; Flora Danica, parts xvi. to xxi.; and Enumeratis Plantarum. Vaillant France.

Vaillant, François de, see LEVAIL-LANT, FRANCOIS.

Vaillant, Jean Foy-(1632-1706), a French vais. He

E. by or and medals for the royal cabinet, and published Numismala Imperatorum Romanorium Præstantiora, 1674; and Numismala Numismala

Vaillant, French bote Pontoise. At first a musician and then a surgeon, he ultimately became director of the Jardin des Plantes, 1708. His great work is Bolanicon Parisiense, pub. 1727.

the others of Vishnu, e over the

other gods of the Trimurti. Vaisyas, in the Sanskrit designation, the members of the third caste as distinguished from the Brahmans or fuesto and the Kshatriyas or

warriors. Vajda-Hunyad, a tn. with a magistracy in Hungary, 81 m. from Temes-Pop. 4400.

Valabhacharya, an Indian se named after its founder Valabha, sect, Telugu Brahman of the 15th and 16th

French, German, and spoken by the inhabitants. It is one of the most nicturesque cantons of Switzerland.

Valckenaer, Jan (1759-1821), a Dutch diplomatist, the son of Lode-wyk Kaspar (1715-85). He was en-voy to Madrid (1796-1801), and was sent by Louis Bonaparte to make a last effort to prevent the union of Holland with France (1810). He was He was also for a time professor of jurisprudence at Francker.

Valckenaer, Lodewyk Kaspar (1715-85), a philologist and critic, born at Leeuwarden, Holland. He became Leeuwarden, Holland. He became professor of Greek literature and antiquities at Francker, 1741, and in 1766 at Leyden. He edited many

Greek texts.

Valdenses, see WALDENSES.

Valdepenas, a tn. of Spain in the prov. of Ciudad Real, noted for its red wines. Pop. 21,200.

Valdes, Armando Palacio, see PALA-

CIO VALDES, ARMANDO, Valdes, Juan de (c. 1500-44), a Spanish reformer, born at Cuenca. His brother being imperial secretary of state, he obtained the post of secretary to Charles V. of Germany, and afterwards acted in the same capacity While to the viceroy in Naples. While there he attempted to bring about the regeneration of the Church, but though not a Lutheran and not in the least opposed to Catholic doctrine, he was hated by the Romanists. He was hated by the Romanists. He wrote Spiritual Milk; The Christian Alphabet; and commentaries on the N.T.

Val de Travers, a valley of Switzer-

land in the Jura Alps, 13 m. S.W. of The well-known cement Neuchâtel.

is named after it.

Valdivia, the southernmost prov. of the republic of Chile, which, despite the efforts of the government towards encouraging immigration, is not very well populated. The province of V is richly stocked with forests, and the export of various kinds of timber is one of the principal industries. Means of communication are not good. The capital, Valdivia, a commercial port on the Valdivia R., was founded in 1551 by Pedro Valdivia, the con-queror of Chile.

Valdivia, Pedro de (c. 1510-69), a Spanish soldier, distinguished himself in the conquest of Venezuela (1535), and was later entrusted with the subjugation of Chile, where after defeating the Indians he founded Santlago (1541). He was captured and put to death by the Indians during a revolt at La Concepcion, which he

also founded.

Valdosta, a city of Georgia, U.S.A., 156 m. S.W. of Savannah, on the Atlantic coast. It is the port for the local cotton and fruit trade. Pop. 7656.

Valence, a tn. of France, cap, of the varence, a th. of France, cap. of the dept. of Drôme, in a fertile plain, on the l. b. of the Rhone, 65 m. S. of Lyons. It has a fine old cathedral, and manufs. of silk, cotton goods, gloves, leather, etc. Pop. (com.)

28,000.

Valencia, a maritime prov. of E. Spain. The surface is much diversified, being low and level along the coast, but rugged in the interior. The soil is rich, and rice, wine, oil, and mulberries are produced. Area 4150 sq. m. Pop. 852,930. Its capital is Valencia, on the Guadalaviar, 3 m. above its mouth. V. is an ancient city, which has undergone extensive alterations in modern times. Its flourishing university was founded in 1410. There are manufs. of coloured textiles, hats, leather, paper, etc. Pop. 215,000.

Valencia, a tn. of Venezuela, 80 m. W.S.W. of Caraccas, near the W. shore of the Lake of Valencia. It is a well-built city, situated in a fertile district. Pop. 40,000.

Valencia de Alcantara, a tn. in the

prov. of Caceres, Spain, in the middle of a farming district. It is a considerable customs centre. Pop. 9500.

Valenciennes (Lat. Valentianæ), a tn. in the N. of France, 40 m. S.E. of Lille. Pop. 317,000. V. is a fortified city of the first class, with several fine churches and a Jesuit college dating from the 17th century. It is celebrated as the birthplace of Froissart and Watteau. Trade is mostly in oil, sugar, chicory. chemicals, etc. Valency. When chlorine combines

with hydrogen, one atom only of each element enters into combination. With oxygen, two atoms of hydrogen combine, and for combination with nitrogen and carbon three and four atoms are required respectively. One atom of chlorine never combines with more than one atom of hydrogen, and its affinity is satisfied or saturated by the union with one atom. The atom of oxygen requires two atoms of hydrogen to be saturated, nitrogen three, and carbon four atoms. combining power of the elements is known as their 'V.,' and the elements themselves are termed mono-, di-, tri, and tetravalent, according to the number of hydrogen atoms with which they can unite. The metals, as a rule, do not combine directly with hydrogen, and their V. is therefore determined by the number of hydrogen atoms they can replace. Measured by their combining capacity for hydrogen or chlorine (another monad), elements do not always ex-hibit the same valency. Thus one atom of phosphorus is satisfied with three atoms of hydrogen, but can com-

bine with five atoms of chlorine. It is, ! however, generally accepted that the highest number of monad elements with which one atom of an element combines is the V. of that element. Thus phosphorus is regarded as a pentavalent element. When an element can combine with only one monovalent atom, it is said to have one 'affinity.' Phosphorus is a pentalent of the combine of the combi valent element, i.c. it has five affini-In the compound PH, it has three affinities satisfied and two unsatisfied, and therefore compounds of this type are termed unsaturated The V. of an element is compounds. therefore often a variable quantity, and, in many cases, dependent upon temperature and pressure. Thus if the compound PH, (phosphine) be mixed with hydrochloric acid (HCl) and the mixture subjected to pressure, a crystalline compound, phosphorium chloride, (PH₄Cl), is formed in which the phosphorus atom is pen-tavalent. Where, in a compound, an atom is not functioning in its highest recognised V., there is a tendency for the compound to unite with additional atoms to form new compounds. Thus carbon monoxide (CO), in which the carbon (a tetrad) is apparently as a divalent element. functioning unites with an atom of oxygen to form carbon dioxide (CO₂), carbon functions as a tetrad. some cases, molecules of different compounds, in which all the atoms are fully satisfied, unite to form other compounds. Thus hydrogen fluoride and potassium fluoride combine to form the compound hydrogen-potassium-fluoride (HF+KF=KHF2). No precise explanation can be given regarding these compounds, and they are often termed 'molecular combinations,' For theory of V. see any advanced text-book of chemistry, e.g. Roscoe and Schorlemmer : sce also CHEMISTRY.

Valens, Aburnus, a jurist who flourished under Antoninus Pius. He is

excerpted in the Digest.

Valens, Fabius, one of the principal generals of the Emperor Vitellius, for generals of the Emperor Vitellius, for whom in 69 a.d. he won the battle of Bedriacum, which secured the sovereignty of Italy. As consul he remained faithful to the emperor, but was taken prisoner when Vespasian invaded Italy, and put to death.

Valens, Flavius, was emperor of the East (364-378 a.d.). He was the brother of Valentinian I., and was born about 328. His reign marks the decline of the Boman power for dre-

decline of the Roman power, for during it the Goths were admitted into the countries S. of the Danube. It was also characterised by the contests between the Catholics and Arians.

Valentia, or Valencia, a small island

off the S.W. coast of Ireland, where there are several cable and signalling stations, and a small harbour. V. is also important as a meteorological

Valentine, Basil, the name given to a German alchemist who flourished at the end of the 15th century. Triumphal Chariot of Antimony, trans. in 1661, and Halographia, are works of

his hands.

Valentine, Saint, a bishop and martyr of Rome who suffered death probably during the persecution under Claudius II. in 270. St. Valentine's festival falls on Feb. 14, and the name very popular in England; but notwithstanding this, apparently no church has been dedicated to him. The custom of sending valentines probably had its origin in a heathen practice connected with the worship of Juno; its association with the saint is wholly accidental

Valentine and Orson, known to mediæval romance as the sons of the Emperor of Greece, fortuitously connected with the Charlemagne romances. Their story is of folk-lore origin, being based on the common folk-lore legend of a man reared by a bear (Orson=Oursson=bear's son). Versions exist in many languages. chap-book dealing with them

published in Glasgow as late as 1850.

Valentinian, the name of three
Roman emperors: Valentinian I.,
Flavius (364-375 A.D.). The frontiers of the empire were exposed to great danger during his reign. Through his general, Jovinus, he gained a victory over the Alemanui in 366 A.D. In 368 A.D. the Alemanui renewed their attacks upon Eastern Gaul, but V. drove them back. This emperor was a man of ability and a wise administrator. Valentinian II., Flarius (375-392 A.D.), son of Valentinian I. He was at first an Arian, but later abandoned this heresy. Valentinian I tinian I reign son of Africa

of the Vandals. Valentinus, one of the most famous of the Christian Gnostics, was a native of Egypt. He was educated at Alex-andria, but went to Rome about 140 A.D., and remained there through the times of Pius to the episcopate of Anicetus. He found many adherents (Valentinians), especially in the East, and persovered in propagating his doctrines, notwithstanding the consures of the church. His system recognised a series of forms of manifestation of the hidden being of California of the hidden being of California of California of California of the hidden being of the h festation of the hidden being of God: the Demiurgus, or dependent divinity; and the Soter, or Redeemer, whom he regarded as being united with the personal being of Jesus Christ. In

addition to this he names the primal | panied to the East (27 A.D.). Essence the Bythos.

Valenza, a tn. of Italy in the prov. and 7 m. N. of Alessandria, on the R. Po, with silk and jewellery manufs. Pop. 11,000.

Valera y Alcala-Galiano. Juan (1824-1905), a Spanish politician and writer. He entered upon a diplomatic career (1847), serving at Naples, Lisbon, St. Petersburg, and elsewhere. Returning to Madrid (1858), he contributed largely to Albarada's Liberal opposition journal, El Contemporanes (1859). He held various high posts later, becoming Director of Public Instruction coming Director of Public Instruction (1868), ambassador to Lisbon (1881-83), Washington (1885), and Vienna (1893-95). His most famous works are his novels, including: Pepita Jemenez, 1874; Las Ilusiones del Doctor Faustino, 1875; Doña Luz, 1879. V. also wrote short tales: El pajaro verde, the Parsondes; poetry; and critical works, such as Disertaciones y indicion literarios. 1882: ciones 11 judicios literarios. Estudios críticos (2nd ed., 1884); Ecos argentinos, 1901. See Brunetière on 'Juan Valera' in Hist. et Littérature, i., 1884. Valerian, or Publius Licinius Valeri-

anus, Roman Emperor 253-60 A.D., a Roman general and faithful sup-porter of Gallus, after whose death he was elected emperor by the soldiers. V. took his son Gallienus as colleague. and, leaving him in charge of affairs in Europe, himself set out for the East to crush the Persian Sapor I. (257). After some success he was entrapped by Sapor and imprisoned till

death. See Pollio's Life of Valerian; Aurelius Victor's Casares. Valerian (Valeriana), a genus of plants and shrubs with cymes of pink or white flowers. V. mikanii (or officinalis), the great wild V., is a tall plant with pinnate leaves. The root is highly attractive to cats, and is used medicinally.

Valerianaceæ, a small natural order of annual or perennial plants, many of which are fragrant. One of the most remarkable species is Nardostachys Jatamansi, the spikenard of Scripture, a native of India.

Valeric or Valerianic Acid (C₁H₂)

COOH), the name given to the mixture of acids obtained by distilling the macerated plants valerian or angelica with water. It is an oily liquid with an un-pleasant smell (boiling point, 174° C.). There are four isomerides with this molecular formula, of which isovale-There are four isomerides with this 10,500.

molecular formula, of which isovaleric or isopropylacetic acid, and optiScandinavian mythology, Odin's band cally active valeric or methylethylacetic acid are the most important.

Factorum et Dictorum Memorabilium Libri IX. is interesting as a specimen of the transition from classical to 'silver' Latin. There are editions by Halm (1865), Kempf (2nd ed. 1888), Smith (selections with English notes, 1895). See Vossius. De Historicis Latinis: Speed's English trans. (1678).

Valerius, Probus Marcus (or M. V. Probus), a noted grammarian and critic of Nero's reign, a native of Berytus, Syria. A commentary on Virgil's Ecloques and Georgies bears his name, and is often quoted by Servius. V. also wrote a criticism and biography of Persius, and De Notis. See Kübler, De Probi Comment. Verg., 1881: Steub. De Probis Grammaticis.

Valetta, or La Valetta, the cap. and scaport of Malta, on the N.E. coast, headquarters of the British fleet in the Mediterranean and an important coaling station. Its strong fortifications were partly built by the Knights of St. John after 1530; the city being founded, 1566, between Great and Quarantine ports. It became a British possession in 1801. V. has considerable transit trade, and manufs. silk. Pop. 62.000.

Valette, Jean Parisot de la (1494-1568), grand master of the Knights of St. John of Jerusalem at Malta (1557). and founder of Valetta (1566). was noted for his successes against the Turks, particularly for his defence of Malta against the Sultan Solyman (1565). See Mermet, Eloge, 1803; Pfaff, Philippe Villiers et J. de la Valette, 1861; De Thou, Hist. sui Temporis; Vertot, Hist. des Chevaliers de Malte.

Valguarnera, a tn. of Sicily, in the prov. of Caltanisetta, 18 m. E. thereof. Pop. 14,000.

Valhalla, the German ' Pantheon.' a building at Donaustauf near Ratisbon, erected by Ludwig I. of Bavaria between 1830 and 1842 in honour of the great men of Germany.

Valhalla, or Walhalla, in old Norse Scandinavian mythology, the abode of Odin in Asgard. Originally the realm of the dead, it came to be regarded in the Viking age as the home of departed warriors, who spent their days fighting and feasting. See the Greek ELYSIUM.

Valk, a tn. of Russia, in the gov. of Livonia, 90 m. N.E. of Riga. Pop.

of beautiful handmaidens, generally said to be nine in number. Valerius Flaccus, see Flaccus. every battle they were sent forth to Valerius Maximus, a Roman his choose which of the slain should be torian of Tiberius's reign; a friend of conducted to Valhalla. They also Sextus Pompeius, whom he accom-served at the banquets there. Odin's daughter, Brunhild, is one of them. Naval Squadron, with a navy yard, For her story see Wagner's 'Die arsenal, dry docks, and a lighthouse. Walkure,' from Der Ring des Nibe- Pop. (1910) 11,340.

lungen.

Valla, Lorenzo, or Laurentius (c. 1407-57), an eminent classical scholar and controversial writer, said to have been saved from the Inquisition by his patron, King Alfonso V., who contrived his escape to Rome, where he became secretary to Pope Nicholas V. He taught successively at Pavia, Milan, and Naples; and was the author of Annotationes in Novum mentum, De Elegantia Latinæ Linguæ, and Latin translations of Herodotus and Thucydides. See J. A. Symonds, Renaissance in Italy, 1897 - 99 :

Mancini's Vita (Florence), 1891.

Valladolid: 1. A prov. of Old Castile, Spain, 2922 sq. m. in area, including part of the Douro valley. It is largely agricultural, hence called 'granary of the Peninsula.' Fruits, wines, oil, madder, honey, and wax are produced. Pop. 283,394. 2. Cap. of above, and formerly of all Spain, at the confluence of the Pisuerga and the Esguera, 100 m. from Madrid. Among its chief buildings are the cathedral (1585), the museum, and university (1346). Destroyed by fire (1561), the city was rebuilt under Philip II. Columbus died here (1506), and the house occurred to the contract of 1600. pied by Cervantes (1603-6) is owned by the state. The Northern Railway has works at V. Pop. 67,742. 3. A tn. of Yucatan, Mexico, 90 m. S.E. of Merida. Its cat

convent were

(1848).It has cotton manufs. Pop. 14,000. 4. A coast-pueblo of W. Negros prov., 4. A | be slightl

coast-pueblo of W. Negros prov., Negros, Philippine Is., on Guimaras Strait. Pop. 10,500. Vallauri, Tommaso (1805-97), an Italian scholar and historian, pro-(1843). He published editions of Plautus, Horace, Sallust, and others; Hist. of Poetry in Picdmont, 1841; Hist. of the Royal House of Savoy, 1845; a Latin-Halian Dict., 1862-54, and others world. and other works. See his Autobiography, 1879.

surnamed II Valle, Pietro della, surnamed Il Pellagrino (1586-1652), an Italian traveller in the East, who set out as a pilgrim for Palestine and the adja-cent countries (1614). He also visited Persia (1617), finally returning to Rome (1626). His Travels in India and Persia were published in 1658-63. and translated into English in 1665.

Sce Bellori's Vita, 1622.

Vallejo, a tn. of Solano co., Callfornia, U.S.A., on San Pablo Bay (N.E.), 30 m. N.E. of San Francisco. It has shippyrds and iron foundries, while Many Is consists is the back

Ŷalley. Just as mountain ranges and masses result from the great uplifts of the earth's crust by weathering, so great depressions exist between such uplifts. They are usually, however, too extensive to be noted except in maps; when they are sufficiently small to be a prominent feature, they are synclinal Vs. Where, too, the region between two more or less parallel faults has gradually subsided, rift Vs. are formed. The Lowlands of Scotland, the Ghor or Jordan V. are examples. Submerged rift Vs. are occupied by the Adriatic and Red Seas, many lakes being also formed in this way. Where the broken upturned strata of the earth's crust form ranges of mountains (q.v.), longitudinal Vs. are formed by the more rapid denudation of the softer rocks. All these types are determined by geological changes resulting from crystal movement in the earth, the features being softened only by long-continued weathering. In dry climates they are most marked, and the great inland drainage areas of Australia, Central Asia, and N. America may be con-sidered as huge Vs. of this kind. Surface geological features are generally completely marked by the incessant operation of radiant forces from the sun, and the consequent atmospheric changes; the surface of the earth is water and moving ice. Land

very var. streams.

of the history of such land, flowed transversely in the strike. The crod-

weathering can leave them as barriers. River Vs. are thus formed across the strike, and When quit river-gaps. ara narrow and deep, forming ravines or gorges which depend for their other features on the intensity of weathering. They form very striking scenery in dry regions, particularly when the strata are horizontal. The canons of Colorado are terraced erosion River Vs. have forms varying with the course and stage in the life-history of the eroding streams. The effort of erosion and weather alone has a powerful effect in forming the shape of the river V. Curves depend on the nature of the soil through which the while Mare Is. opposite is the head-river meanders; the floor of the river quarters of the United States Pacific | beds also depends on the nature of the

soil—glacial action having the effect aquatic plant (order Hydrochariof widening the bottom, while the daceæ) often grown in aquaria. The deposition of alluvium builds up a flowers are unisexual, the male raised floor. Rias and fjords are sub-flowers being borne at the base of the merged or drowned Vs. Handing Vs. plants, whence they are liberated to are formed by tributary streams of float on the surface. As they pass, less eroding power than the stream the female flower is elevated on its responsible for the main V., they enter spiral peduncle, and after fertilisation its sides at a level above the banks of the stalk again contracts. the mai from reg

flowing these Ve sions are considered to be due to the gradual removal of underground material by solution due to ground water with a definite direction of seenage, or to be more defined underground streams. Glaciated Vs. occur in high mountains and regions of per-petual snow; they are carved by the moving ice streams, and differ from river Vs. in having a U-section, with steeper banks, usually rocky and precipitous. Ancient Vs. of this type, but weathered out of typical form, are found in N. America and Europe as relies of the glacial age; they often contain moraine-dammed lakes. Vs. are natural communica-tions and highways, and, when ex-tensive, the homes of civilisation. Exypt was the lower Nile valley and delta. Mesopotamia and the Tigris and Euphrates Vs. gave rise to three typical communities, Chaldea, Babylonia, and Assyria. The first, in the lowest part of the valley, was typically agricultural; the second, in the middle region, had broader and more vigorous pursuits, including both agriculture and pasture; the last was more truly pastoral, of narrower pursuits but hardy. The influence of the home is in each case reflected in the civilisation of the community, and the same stages are marked in most Vs. See J. Geikie, Earth Sculpture, 1898; J. E. Marr, Scientific Study of Scenery, 1900; also the bibliography under MOUNTAINS and RIVERS.

Quebec, Valleyfield, of a tn. Canada, in Beauharnois co., on the R. St. Lawrence, at the upper end of Beauharnois Canal, 36 m. W.S.W. of Montreal. There are cotton, woollen, and saw mills, etc. flour, 12,600. Pop.

Vallisneri, or Vallisnieri, Antonio (1661-1730), an Italian naturalist, pupil of Malpighi at Bologna. He practised medicine at Reggio (1688), becoming professor of practical medicine and natural history at Padua (1700). His chief work, Istoria della Generacione dell' Uomo e depli Arivali (1721), was him buffalia. Animali (1721), won him Buffon's praise. Vallisneria is named after him. See Tipeldo, Biographia degli

Vallombrosa, a Benedictine convent in Vallombrosa Valley, 16 m. E. of Florence, Italy, founded by St. Gualbert (c. 1038). The present building dates from 1637. The abbey was suppressed and became a school of forestry after 1869. It is mentioned in Ariosto's Orlando Furioso and Milton's Paradise Lost.

Vallota, Vallota, or Scarborough Lily, a genus of bulbous plants (order Amaryllidaceæ) bearing handsome scarlet flowers. V. purpurea and its varieties are commonly grown in greenhouses.

Valls, a tn. of Spain and cap. of the dist. Valls, in the prov. of Tarragona, with manufs. of textiles and paper.

Pop. 13,000. Valmy, a vil. of Marne dept., France, 6 m. from Ste. Menehould. A pyramid (1819) on a hill in the S. commemorates the victory of the French Revolutionists under Kellermann and Dumouriez over Prussians (1792). Pop. 500.

Valois. Adrien de (Adrianus Valesius) (1607-92), younger brother of Henri de Valois. From 1646-58 he published his great historical work of France, under the title Gesta Francorum, seu de Rebus Francicis. This work com-prises the history of France from 254-752 A.D.

Valois, Charles de, see Angoulême, CHARLES DE VALOIS, DUKE OF.

Valois, Henri de (Henricus Valesius) (1603-76), a French scholar and royal historiographer. In 1622 he went to Bourges to study jurisprudence, and after the completion of his studies he practised for several years as a lawyer. His chief work is a new edition of the Greek writers on ecclesiastical history.

Valois, House of, a French dynasty, ruling 1328-1498 and beginning with Philip VI. (1328-50). Next came John (1350-64) and Charles V. (1364-80), under whom France suffered severely in the war with England. She was defeated at Crecy and Poitiers (1346 and 1356), and John was taken prisoner to London. The state was reduced to bankruptcy, the nobility grew rebellious, the people almost barbarous. Charles VI. (1380-1422) was defeated by Henry V. at Agin-court (1415). France was saved by m. See Tipeldo, Biographia degli Joan of Arc, who had Charles VII.
cliani Illustri. (1422-61) crowned at Rheims. He
Vallisneria, or Spiralis Eel Grass, an instituted a special tax for a regular army. His successor, Louis XI. (1461-83), kept down the nobles; and recovered Maine, Anjou, and Provence, and part of Burgundy, which the pericarp of pods splits open charles VIII. (1483-98) secured Brittany by his marriage with Anne of Brittany. He had no son, and the crown passed to Louis of Orleans (XII.), the first of the Valois-Orleans house.

Valparaiso: 1. The name of a prov. and its cap. in Chile, S. America. The prov. has an area of 1953 sq. m. It is mountainous and somewhat barren. but cereals are grown. Pop. 299,466. The town is a scaport on the Pacific, in communication by rail with Buenos Ayres, and some 66 m. N.W. of Santiago. There are regular steamship services to Europe and the States; whilst breweries, foundries, and machinery and railway work-shops account for its busy industrial life. Copper, nitrate, silver, and wheat are exported. Dirty, unprepossessing streets, to say nothing of earthquakes, belie its name ('Paradise Valley'). £3,000,000 is to be spent on the construction of a dock and harbour. Pop. 179,815. 2. A university tn. and the cap. of Porter co., in Indiana, U.S.A. It lies 38 m. S.E. of Chicago. Pop. (1910) 6987. Valpy, Richard (1754-1836), an Eng-

lish schoolmaster, born in Jersey. Took orders in 1777, and was head-master of Reading Grammar School (1781-1830). His Greek and Latin grammars attained a wide reputation. His brother, Edward (1764-1832), and his son, Abraham John (1787-1854),

were classical scholars.

Vals-les-Bains, a vil. and spa in the

vals-ies-Bains, a vil. and spa in the canton of Aubenas, France. Its waters have similar properties to those of Vichy. Pop. 4352.
Valtellina, the valley of the Upper Adda, prov. of Sondrio, N. Italy. It is generally held to include the Liro or San Giacomo Valley, and extends to Lake Como (44 m.).

Valuation, see Book, APPRAISEMENT, EXTENT, DOMESDAY

RATING.

Value, in political economy, the quantity of labour, or of the product of labour, which will exchange for a given quantity of labour, or of some other product thereof. Utility must be distinguished from V., or, in Adam be distinguished from V., or, in Adam Smith's phraseology, value in use from value in exchange. Water, being hard experience of utility or of V. in use, but as it can generally be obtained in large quantities without much labour or exertion, it has but a low V. in exchange. Diamonds, on the other hand, which exist only in limited quantities and require extraordinary labour in production, are of comparations with the screw; it is practically a with the screw; it is practically a with the screw; it is practically a fund-operated poppet V. To avoid the evils of varying boiler pressure, but each graph of the crow; it is practically a with the screw; it is practically a fund-operated poppet V. To avoid the evils of varying boiler pressure, but evils of varying boiler pressure, but as it can generally be obtained in large quantities without much labour in exchange. The entering steam passes by the valve, closed by a spring to the throttle valve, which it ifts, and then acts on the piston. The steam can then pass through a colled pipe on a dia-

Valves are the two parts into which the pericarp of pods splits open along defined lines to liberate the seeds.

Valves. Mechanical contrivances for regulating the movement of fluids along pipes. The flap V. is one of the most common, worked by the pressure of the fluid itself. A special seating is provided in the pipe, and the flap is simply a hinged metal door opening and closing on this. faced with leather, rubber, or such material which will make the closing fluid-tight. The double form is known as the butterfly V. In both cases a guard is arranged to prevent excessive opening. This type is suitable only for low pressure and slow beat, c.g. in the case of hand suction pumps. The poppet, or mushroom V. is not hinged. Usually circular in form, it lifts bodily from its seating, and some form of guide is arranged to ensure true working. The seating and the fitting end of the poppet are generally worked into conical form which gives a better fit and some self-adjustment to wearing due to friction. In addition three flanges are usually cast on the end fitting the orifice. An arrangement is provided to prevent too great a jump; this may be merely a metal guard, or rubber rings working against a fixture above, or a spring of adjusted power; in which two last cases the V. may be lighter, not closing by its own weight. Such V. are suitable for higher speeds and pressures which would rapidly throw a hinge out of action. There is, however, the difficulty of shock to be met, partly by reduction of weight of moving parts, partly by reducing the area of contact, and partly by reducing the lift. By providing a double seating, as in the double beat V., half the lift only is required. Fouraro used for powerful engines in extension of this principle. In the Pulsometer (see Pumps) and other high speed engines a ball is used as a V. For air pumps, V. of rubber are generally used. Stop V. for opening and closing a port at will are often operated by hand; in this ease the V. is attached to a spindle which raises or lowers it by means of a screw thread, the V. not turning with the screw; it is practically a hand-operated poppet V. To avoid

phragm, above the steam chamber, thus operating a lever and partially closing the steam pipe if the pressure is too great. Cocks are a form of V. usually operated by hand; a seating is provided in the pipe into which a conical plug is inserted. Through this is drilled a hole which by the turning of the plug can be made to continue the passage of the pipe through the plug, or lie across the passage, and interrupt the flow of fluid. They are used in water pipes in houses, but are not suited for rapid working at great pressures, as the suddenness of action gives rise to too great shock.

Safety valves are attached to boilers or other vessels where the fluid contents may reach a pressure great enough to cause bursting. The deadweight safety V. has a spherical V. fixed to a cover piece which can be loaded with weights. These are adjusted so that the V., the shape of which prevents sticking, will lift if pressure through the pipe becomes too great. There is good stability owing to the low centre of gravity. The lever safety V. has a conical V., the pressure on which is adjustable by means of a weight acting at the end of a lever. The moment steam escapes its lifting force varies in a manner differing with the shape of the V. and opening; usually the lift required to keep the passage open is greater than that required to open it, and it would be better if load diminished with opening. The use of springs intensifies this difficulty. In placed on the same V. two or three are placed on the same V. box so as to produce more opening for the lift. Long springs are used and so adjusted that an opening of not more than ! in. will be necessary, thus reducing the increased lead. On reducing the increased load. reducing the increased load. Un locomotives springs are always used, the 'Ramsbottom' being very largely used. Both V. are operated simultaneously by the spring acting on the lever. The fulcrum by its position ensures the lessening of the load if the V. lifts. The extension of the lover provides a means whereby the engine driver may test whereby the engine-driver may test either V. for sticking or obstruction. The 'Naylor' contrivance is largely used for spring safety V. The V. is pressed on its seat by means of a spring acting through a bent lever so arranged that the opening and pressure on the spring alter the leverage, thus not increasing the load. The low-water safety V. used on sta-

phragm, above the steam chamber, blows off. There are various ways of thus operating a lever and partially closing the steam pipe if the pressure is too great. Cocks are a form of V. usually operated by hand; a seating is provided in the pipe into which a conical plug is inserted. Through this is drilled a hole which by the turning it he period of lift.

Vambéry, Armin (1832-1913), a Hungarian Orientalist and traveller, born at Duna-Szerdahdy, on an island in the Danube. He became a schoolmaster; and acquired a wide knowledge of European, Turkish, and Arabic tongues. Between 1862 and 1864, disguised as a derrish, he penerated to Khiva, Bokhara, and Samarkand. He visited London and Paris, and finally was appointed professor of Oriental languages at Budapest. He has published: Travels in Central Asia, 1867; an Ausbiography, 1883; Western Culture in Eastern Lands, 1906; Coming Struggle for India, 1885; Hungary, 1887; Central Asia and the Anglo-Russian Frontier Oueslion

Vampire, a monster which figures largely in the black superstitions of Russia, Servia, and Poland; and which, with slight modifications, darkens the folklore of many peoples. It is primarily the spirit of a dead man, which, leaving the grave by night, sucks the life-blood of sleepers till they waste away and die. Wizards, witches, suicides, and werewolves are especially prone to become Vs.

Vampire Bats, which are true bloodsuckers, are found in South America,
and belong to the genus Desmodus in the family Vespertilionride.
They are small creatures, and suck the
blood of man, cattle, and horses. The
bats which are found in the genus
Vampyrus feed on fruit and insects,
and have no share in the dictary of
Desmodus.

Van, a tn. of Turkey in Asia on the castern shore of Lake Van. V. has a considerable trade in corn and rice. The town is prosperous and has good cafes, schools, and bazaars. It is supposed to have been a place of residence of Semiramis. There are many antiquities and cuneiform inscriptions.

Van Achen, Hans (1562-1615), a German historical and portrait painter, born at Cologne. He settled at Munich in 1590, becoming court painter to William V.; and at Prague in 1601, becoming court painter to Matthias I. in 1612.

thorewards safety v. disconstructionary engines is loaded directly by a spindle with a weight, but negatively by a weight acted on by a float through a lever. If water is too low the float increases in weight and reduces the load on the V. so that steam

in a stream of pure hydrogen. It is a again, but without success, in 1841, greyish metal with a high melting- 1848, and 1856, finally withdrawing greyish metal with a high melting 184 point (about 1700° C.) and has been his used in making hard steels. Vanadium forms five oxides, corresponding to the oxides of nitrogen; and three chlorides. The pentoxide, formed by burning the metal in air, gives rise to the vanadates.

Van Beers, Jan (1821-88), a Belgian poet, taught Dutch language and literature in Malines, in Lierre, and from 1860 at the Athenœum in Antwerp. There is a warmth, simplicity, and vigour about his songs and ballads — Jongelingsdroomen, Levensbeelden, 1858; and Rijzende Bladen, 1883-which remind the

reader of Longfellow.

Vanbrugh, Irene and Violet, English actresses, are daughters of the late Rev. R. H. Barnes. Both are leading actresses on the London stage. Miss frene V. married Mr. Dion Boucleault in 1901, and Miss Violet V. married Mr. Arthur Bourchier in 1894.

Vanbrugh, Sir John (1664-1726), an English dramatist and architect, born in London, was controller of the Board of Works from 1702. He de-signed Castle Howard (1701) and the signed Castle Howard (1701) and the Haymarket Theatre (1705), and drew the designs for Blenheim Palace (1705). As early as 1696 his first play. The Relapse, was produced; and this was followed by many others, including The Provoked Wife (1697), The False Friend (1702), and The Confederacy (1705). His plays were witty, but mayred by licentiqueness. He

jeaeracy (1705). His plays were witty, but marred by licentiousness. He was knighted in 1714.

Van Buren, Martin (1782-1862), an American statesman, born at Kinderhook, New York state, of Dutch descent. He devoted himself from early life to law and politics, and attached himself to the Democratic plays the U.S. party, being elected to the Senate in 1821. He opposed U.S.

establishment of the state supported war with England advocated the raising of the and the liberal extension o He warmly supr franchise. the candidature of General Ja for the presidency in 1828, and his administration became s sively governor of New York secretary of sta of the Union,

cess owing to the opposition of taught. About 406 they began to congress. His presidency was also swarm into Gaul: and their restless-troubled by disputes with England ness soon drove them across the and a commercial crisis which in-Pyrences to Spain, where, after much volved the country in numerous bloodshed, they settled down with loans. V. B. stood for the presidency the Alans in Andalusia ('Vandalitia').

candidature in favour of Buchanan.

Van Ceulen, or Keulen, Ludolph (d. 1610), a Dutch mathematician, born at Hildesheim. He taught porn at Hildesheim. He taught mathematics at Breda and subsequently at Amsterdam. His chief claim to fame is the great accuracy he attained in the expression by numbers of the ratio which the circumference of a circle bears to the diameter.

Vancouver: 1. The cap. of British Columbia. It is the terminus of the Canadian Pacific Railway, and a port of call for steamers to China, Japan, Australia, and San Francisco. Japan, Austrana, and San Francisco. The city possesses an opera house, Carnegie library, several hospitals, and the Vancouver College. It is a centre for the great lumber trade of the province. Pop. 185,600. 2. A tn. near Portland, Oregon, U.S.A. Pop. 1851,0200. (1910) 9300.

Vancouver, George (1758 - 98), a British navigator, who accompanied Cook in his second (1772-74) and third (1776-80) voyages. In 1791-92 he was engaged in exploring the N.W. coast of N. America from 39° 27' N. to 52° 18' N., including the island which was named after him. which was named after him. A complete account of his voyage appeared in 1798.

Vancouver Island, an island on the Pacific coast of N. America, separated from the mainland of British Columbia, to which it belongs, by Queen Charlotte Sound and Georgia Strait. Gold, iron, copper, and coal are found. There are about 100 m. of railway belonging to the Canadlan Pacific Railway Company. Van Dale, Anton (1638-1708), a Dutch theologian and physician. He

acted as preacher among the Menno-He opposed the nites until appointed physician to the

9, 1700; lolatrico

people Goths. hinterdoed to Roman

In the days of Aurclian (271) as a Vandal wing to the lm-Jackson as pre the interest of the interest of

At the rash bidding of Boniface. Count of Africa, they landed en masse (possibly 80,000) on African shores (429), and having possessed themselves of Hippo (431) and Carthage (439) were soon masters of the whole province. Availing himself of the tumult consequent on the murders of Ætius and the Emperor Valentinian III., Gaiseric (or Genseric), the Vandal leader, appeared with his formidable array before the gates of Rome (455), and, having formally occupied that city, proceeded to carry out a systematic plunder be-fore the very eyes of the helpless Romans. But retribution was soon to follow the remorseless persecutions of the Catholic Christians under Gaiserie and Hunneric, his son, the persistent ravages of Vandal pirates up and down the Mediterranean, and (above all, perhaps) that luxury, effeminacy, and sloth which had already undermined their pristine temperance and valour. In 534 King Gelimer, having suffered defeat at the hands of Justinian's general Belisarius, both at Ad Decimum and Tricamaron, finally acknowledged the supremacy of Rome, and thus brought to an abrupt conclusion the independent history of his tribe. Vandamme, Dominique René (1770-

1830), a French general, born at Cassel (dept. Nord). He entered the army in 1786, served under Napoleon in the Rhine campaign (1795) and at Austerlitz. In 1813 he was compelled to surrender at Kulm, and was treated with great harshness during his imprisonment. He fought for Napoleon during 'the hundred days' and was exited after Waterloo. See Du Casse, Le Général Vandamme (1870).

Vanderbilt, Cornelius (1794-1877), American financier, born at Stapleton. Descended from Dutch ancestors exiled by religious persecution. Early showed commercial ability and gradually built up a large business steamboat round New York. In 1863 started speculating in railways with great success. Left an immense fortune to his children. IV. H. Vanderbill (1821-85), his son, born at New Brunswick. Com-mercially successful independently of his father; he helped later to organise some of his father's enterprises. Made large educational and charitable gifts during his life and by his will. W. H. Vanderbill (1843-99), son of W. H. (supra); carried on his father's businesses, in which he was aided by W. K. Vanderbill (b. 1849), his brother, who is the chief member of the family controlling the vast enterprises undertaken by the Vs., who are among the richest American millionaires.

Vanderdecken, see FLYING DUTCH-MAN.

Van der Goes, Hugo, see GOES,

HUGO VAN DER.

Van der Helst, Bartholomew (c. 1613-70), a Dutch portrait painter, pupil or imitator of Frans Hals. With Van Helt-Stokade he founded the guild of St. Luke. He sometimes painted sacred and mythological subjects.

Van der Heyden, Jan (1637-1712), a Dutch architectural and landscape painter, born at Gorinchem. He painted in partnership with Adrian van de Velde, who supplied the figures

for his pictures.

Van der Meer, Jan (the Elder, 1628-91), a Dutch landscape painter, born in Haarlem. He was a pupil of Jacob de Wet, and excelled in his paintings of Holland. Jan van der Meer the Younger, 1656 - 1705), a Dutch landscape painter, born in Haarlem, son and pupil of the above.

Van der Meulen, Antony Francis (1634-90), a Flemish painter, born in Brussels. In 1666 he was called to Paris as battle-painter to Louis XIV.,

Paris as battle-painter to Louis AIV., for whom he executed the campaigns of Flanders (1667). He was admitted to the French Academy in 1673.

Vandervelde, Emile (b. 1866), a Belgian socialist and politician, studied law at Brussels and was called to the bar in 1885. His chief energies, however, were devoted to the study of social questions, and in 1894 he was sent to represent Charleroi in the Chamber of Deputies. He has especially devoted himself to the land question and to the furthering of co-operation amongst workers. He has written several works both alone and in collaboration with others.

Van der Werff, Adrian (1659-1722), a Dutch historical, genre, and portrait painter, born near Amsterdam. In 1696 he was appointed court painter to the Elector Palatine, who knighted him in 1703. His brother, Picter van der Werff (1665-1718), was

his pupil and assistant.

his pupil and assistant.

Van de Velde, the name of three Dutch painters: Willem the Elder (c. 1611-93), was appointed naval painter to Charles II. of England (1657). Willem, the Younger (1633-1707), son of the above, whom he succeeded as marine painter to Charles II. (1679). Adrian (1639-72). Charles II. (1679). Adrian (1639-72), animal and landscape painter, son of Willem Van de Velde, the Elder, was born and died at Amster-

Vandianus, Joachim, alias Joachim van Watt (1484-1551), a Swiss scholar, born at St. Gall. He studied at Vienna, and after spending some time in travelling through Hungary, Poland,

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Germany, and Italy, returned Vienna and became professor. He wrote: De Poetica et Carminis Ratione, 1518; Commentarii in Pomponium Melam, 1518; Scholia in Plinii Historium Naturalem, 1534.

Gulf, Diemen's between Van Diemen's Guii, Debreun Coburg Peninsula and Cape Hotham and Melville Is., N.W. Australia. It is 100 m. long by 60 m. broad. Van Diemen's Land, see Tasmanta. Van Dyck, Sir Anthony (1599-1641).

a Flemish painter, was born in Ant-werp, where in 1619 he opened a studio. His fame as a portraitpainter soon spread, and in the next year Lord Arundel invited him to come to England, where he was em-ployed by James I. He went to Italy in 1621, and after four years' wandering, settled again in Antwerp, where to London and was knighted by Charles I. Except for some months, he spent the remainder of his life in England. The king assigned V. D. a house in Blackfriars, and there he and the queen used to go from time to time to sit for their portraits, several of which were executed and are among the artist's masterpleces. He employed assistants, but always himself made the first sketch of each portrait, and gave each canvas its

finishing touches.
Vane, Sir Henry (the Elder, 1589-1655), an English statesman, was knighted in 1611, and from the next year held various posts in the royal household. He entered parliament in 1614, and was employed on various missions and commissions. In 1640 he was made a secretary of state, but he was dismissed from this and his other offices in the following year life, preaching a modern anti-religious for supporting the impeachment of Strafford. He then threw in his lot ter being with the parliamentary leaders.

Vane, Sir Henry 1613-62), an English

eldest son of Sir Henr, After spending two years in America, Wature Arcanis, 1616.

where he was governor of Massachusetts (1636-37), entered parliament review, founded in 1868, and in its carliest years the foremest society hughted. In 1641 he was, for his carliest years the foremest society paper of the day. The series of pending the share in the

ford, dismisse of the navy. H mentary part him to his old 1650. He too

omas Bowles was editors, 1648 was one of the commissioners who treated with Charles I. at Newport, but he refused to take part in the king's trial. In the early years of the Commonwealth he was one of the leading spirits; but in 1653 he of Savoy, Colley Cibber, and Sir quarrelled on a political matter with Cromwell, by whom three years later of painting in Paris (1735)

to he was imprisoned for a pamphlet against the protector's arbitrary methods. He took an active part in the restored Long Parliament (1659), but was early in 1660 expelled—his efforts as a peacemaker having turned all parties against him. After the Restoration, he was tried for high treason and executed on Tower Hill. There are biographies by John Forster (1838), Hosmer (1888), and Wellcock (1913).

Vanessa, a genus of butterflies in the family Nymphalide. Several species are well known in Britain: among these are Pyrameis (or F.) cardui, the painted lady; and P. or V.) atalanta, the red admiral.

Van Eyek, see EYek. Van Helment, Sprees Jacobus (1883-1720 to Francis Fundaments [183-1720 to Francis Fundaments [183sacrificing before the Priests of Baal' (all of which are in Brussels), and 'Christ on the Cross' (in Ghent

Museum). Vanilla, agenus of climbing orchids, natives of tropical Asia and America with fleshy leaves and large white and yellow flowers. The V. of commerce is an aromatic used in the flavouring of confectionery and food. It is derived from the long dried pods of V. planifolia which is extensively cultivated in tropical countries.

Vanini, Lucilio (1585-1619), an Italian freethinker, who wrote under the pseudonym of Giulio Cesare. Born at Taurisano, he studied at Naples and Padua and was inflamed with the 'New Learning.' He was ordained priest and led a wandering

ed at the

6 Amphi-Ælernæ Providentiæ Divino-1, 1615; and De Admirandis

of men of public note by and, later, the chromo-caricatures, especially brities, by the inimitable e outstanding features. omas Bowles was editor

Charles André (1705-65), his younger | brother, was born at Nice and studied at Rome. He was employed by the King of Sardinia, and became principal painter to the King of France. His 'Marriage of the Virgin' is in the Louvre.

Vanmander, Carel (1548-1606), a Flemish painter and writer, was born at Meulebeke and became a pupil of Lucas de Heere. He wrote Het Schilder Bock, an account of the Italian and Flemish schools from 1366 to 1604, translations of Homer and

Virgil, and a good deal of verse.

Vannes, a seaport of W. France, cap. of the dept. of Morbihan in Brittany, with shipbuilding works and manufactures of woollens and ropes. Pop. (estimated) 23,000.

von. (estimated) 23,000. Vanni, Francesco (1565-1609), an Italian painter, born at Siena. His Simon Magus was painted for St. Peter's, Rome. His other works include a 'Picta,' an 'Assumption,' and a 'Marriage of St. Catharine.'

Vannucci, see PERUGINO. Van Oost, Jacob (1600-71), a Flemish painter; was born at Bruges and studied under Carracci. His son, Jacob van Oost (1639-1713), was an eminent portrait painter, and many of his and his father's sacred paintings may be seen in the churches of Bruges.

Van Os, Pieter Gerard (1776-1839). a Dutch painter and engraver, was born at the Hague. Taught by his father, Jan Van Os, he studied the works of Potter and excelled in painting cattle. He also executed etchings from his own designs and from Potter

and Berchem.

Van Rensselaer, Stephen (1764-1839), an American statesman, born at New York. Descendant of Killian Van R., an early colonist. In 1789 entered the Assembly as a Federalist. From 1791-96 he was a state senator, and sat in the Assembly again in 1798 and 1808-10. Became major-general of militia in 1801, but resigned in 1812 on his defeat at Queenston by the British. Energetically promoted the Eric and Champlain canals, 1811-Sat in Congress, 1823-29.

Vansittart, Nicholas, first Baron Bexley (1766-1851), an English statesman, entered parliament in 1796 as a supporter of Pitt, and later supported Addington. He was secretary of the treasury 1801-4, and again in 1806-7—being in the interval Chief Secretary for Ireland. He was Chancellor of the Exchequer from 1812 until 1823, when, being created a peer, he went to the Duchy of Lancaster, where he remained for five of caster, where he remained for five

years.

Van't Hoff, Jacob Henry (b. 1852), a Dutch chemist, born at Rotterdam: given by the Greeks and Slavs to the studied anatomy, chemistry, and Northmen or Scandinavian rovers

mineralogy in Holland, France, and Germany, and in 1878 was appointed professor of chemistry at Amsterdam. In 1896 he became professor to the Academy of Sciences at Berlin. His great work has been in connection with stereo-chemistry. Taking up the discoveries of Wislicenus in onection with the lactic acids. enunciated in 1874 his discovery that 'in carbon compounds which exhibit the property of rotating the polarised ray in either direction, the polarised ray in either direction, the molecule in every case contains at least one atom of carbon combined in four different ways '(Tilden), and, later, taking up Kekulé's doctrine of the linking of atoms, he worked it out with great success. In 1894 he published a paper which threw much light on the perplexed subject of solutions in electro-chemistry. See On the Formulas of Structure in Space, 1874; Ten Years in the History of a Theory (Eng. ed. by Marsh); and various articles in periodicals; see also Tilden's Short History of the also Tilden's Short History of Progress of Scientific Chemistry.

Van Tromp, see Tromp. Van Veen, Maerten, see HEEMSKERK,

MAERTEN JACOBSZ.

Vanvitelli, Luigi (1700-73), Italian architect, son of a Dutch painter, born at Naples. He held the office of architect to St. Peter's in Rome, and he built the churches of St. Francis and St. Dominic at Urbino and the magnificent convent of St. Augustine at Rome. Charles III., King of Naples, chose him to build the palace at Caserte, of which V. has left the 'Plans et Dessins.'

Van Wert, the cap. of Van Wert co., Ohio, U.S.A., 27 m. W.N.W. of Lima. It manufactures railway engines.

Pop. (1910) 7157.

Vapereau, Louis Gustave (1819 -1906), a French author, born at Or-He became a teacher of philosophy, then an advocate, and finally abandoned law for letters. His Dictionnaire Universel des Contempo-rains (1858) and his Dictionnaire Universel des Littératures (1877) are his best-known works.

Vapour, see GAS AND GASES.

Var. a dept. in the S.E. of France. bounded by the depts, of Bouches-du-Rhône and Alpes Maritimes. a mountainous and wine-producing region; silk, paper, and soap also being manufactured. Area 2333 sq. m.

Cap. Draguignan. Pop. 330,755.

Varallo, a tn. in the prov. of Novaro, Piedmont, Italy, 30 m. N.W. of Novaro. In the vicinity is Sacro Monte—a pilgrim resort. Pop. (est.)

4200.

who threatened Constantinople in his masterpieces are a 'Calvary'; the 9th and 10th centuries. They Generation of Jesus Christ,' better were checked by Vladimir, who christen as 'La Gamba,' in Seville were checked by Vladimir, who christianised his subjects in 988, and from that time till the Turkish capture of Constantinople in 1453 there was a bodyguard of Varangians in the city. See Scott, Count Robert of Paris.

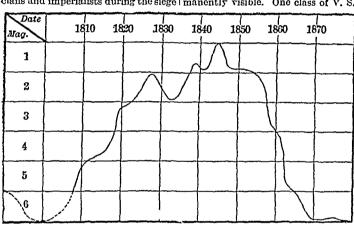
Varasdin, a tn., known as a royal free city, cap. of the co. of Varasdin,

Hungary. Pop. 13,000.

Varberg, a seaport tn. in the län of Halland, Sweden, on the Kattegat, 36 m. N.N.W. of Halmsted. It is a

Cathedral; and in the Louvre a 'Virgin and Infant Jesus' and a 'Holy Family.

Variable Stars. Continuous observation shows variability in the light of many stars. Although the heavens show little change from the time of Hipparchus and Ptolemy there are evidences of variation; thus & Lyre, then the brightest in the Scorpion's It is a claw, is less bright than Antares; and much frequented resort, and trades in Pollux, now brighter than Castor, was, butter and fish. Pop. 7376. according to Bayer, inferior. Some Varchi, Benedetto (1502-65), a stars have possibly ceased to exist, flought for Florence against the Medians and imperialists during the siege manently visible. One class of V. S.



VARIABLE STARS

(From C. A. Young's General Astronomy. Ginn).

Tiraboschi, Storia della Letteratura Littér. Ginguené, Hist. Italiana : d'Italie.

Vardar (ancient Axius), a riv. rising in the vilayet of Kossovo, Turkey, and flowing into the Gulf of Salonika. Length about 200 m.

Varga Spanish D

of 1530 (being exiled after the fall of fluctuates irregularly; η Argus (η thecity), and again in Strozzi's expedition (1536). V. was later patronised the diagram, a Orionis, a Herculis, and V. was later patronised the diagram, a Orionis, a Herculis, and His Storia Fromitia, a Cassiopeic are examples. Such stars by Cosimo I. His Storia Fiorentina, a Cassiopeire are examples. Such stars 1527-38, appeared in 1721. He also never have a period of more than wrote Sonetti (1557), dialogues, and two or three years or a range of one translations from the classics. See magnitude, with the exception shown, and the classics of the classics of the classics of the classics of the classics. which has also apparently corresponding changes in the surrounding The o Ceti type of long. nebula. period variables show regular periodic changes generally in a cycle of from 6 months to 2 years, but occasionally much shorter (see MIRA). Many of Length about 200 m.

Vardō, at n. on the island of Vardō, the stars are red or reddish. π Norway. The chief exports are fish, glano, and oil. Pop. 2600.

Varennes, a tn. of France, in the dept. of Indre, 29 m. S.S.E. of Blois, on the R. Cher. Pop. 1150. de (1502-68), a Vargas Luis of Seville. Among Vargas are marked, the lines spanish planter of Seville. Among

doubling. for β Lyræ two large spheroidal gaseous bodies at a distance between centres of 50,000,000 m., the smaller 2½ times as bright and half as massive as the larger; the density he gives as de Variation, 1848; Noigno and Lindelof. Calculus des Variation, 1871; Jellet, Calculus of Variation; Culverwell, Trans. Roy. Soc., clxxviii., 1887; speculative. Algol or β Persei is the type of another class; its period is 2 days, 20 hrs., 48 min., 55 4 secs., 15, 1879.

during which it is mostly at the 2nd magnitude. In about 4½ hours it falls to a minimum, 4th magnitude. to a minimum, 4th magnitude, where it remains for 20 min., then recovers its brightness in 3½ hrs. There are between thirty and forty of these stars known. In 1889 Prof. Vogel determined spectroscopically that stars known. variation was here due to eclipse by a dark companion; this is the accepted explanation for all, and the short period is due to the closeness of the bodies. As a class these Algol stars are noted for their low mean density. Prof. Pickering in 1895 announced the discovery of V. S. clusters, that is clusters containing many variables. Messier 3 contains 132; ω Centauri, 122. As a rule the changes in these are rapid. The reasons for variability beyond that of eclipse are not deter-The presence of large spots mined. or eruption areas, as on the sun, is one possible explanation. Prof. Lockyer has put forward a collision theory, founded in swarms of meteors moving in orbits allowing interpenetration. The discovery of V. S. has been rapid since the employment of photography, the Harvard catalogue of 1907 giving 3748, 1791 of these being in the Magellanic clouds.

Variation, in music, is a vocal or instrumental embroidery on a given theme, usually ending with a brilliant

coda.

Variation, Calculus of. Just as the differential and integral calculus deals with the laws of fixed curves, the C. of V. traces a curve in its variations of form. The introduction was due to J. Bernoulli (1696) who propounded the problem: To find the path of shortest time traversed by a point M in falling freely under the influence of gravity from a point A to another B situated in a vertical plane. For this purpose it is neces-sary to consider not merely the change in y due to a variation in a single variable x, but the further variation due to a change in relation between a number of variables with which y is connected by some law. The problem resolves itself always Varna (ancient Odessos or Tiberio into that of finding a number of polis), a prov. and fortified tn. of Bul

Prof. Myers has deduced functions satisfying the given conditions and from these to find the integral involving them and one or more of their differential co-efficients, this integral to be a maximum or a minimum. See Sarrus, Recherches sur

> They are found in the lower part of the body, affecting the lower leg and thigh, causing hæmorrhoids or piles if the rectum be involved, and varicocele when the spermatic cord is affected. They are caused by occupations involving a great deal of standing, constriction such as that caused by tight garters or pregnancy; or may be associated with general debility or a hereditary tendency. The best treatment for varicose veins in the legs is the wearing of an elastic bandage, and as much rest as possible with the legs horizontal or elevated. Varicocele is rarely troublesome; if it causes real distress, the excision of the dilated veins will cure the disease. Varius, Rufus Lucius, a Roman poet

of the 1st century B.C. Maceenas was his patron; and he was a friend of Horace and Virgil, becoming a literary executor of the latter (19 B.C.). His tragedy Thyestes was highly valued, and he also wrote epics. Only See Weichert fragments are extant. De Vario Poeta, 1829; De Varii Casii Parmensis Vita, 1836.

Varley, Cornelius (1781-1873), an English water-colour painter, younger brother of John (q.v.), born in London. He exhibited occasionally in the Royal Academy, and is noted as the inventor of the graphic telescope.

Varley, Cromwell Fleetwood (1828-83), an English electrical engineer, son of Cornelius. He invented a double-current key and relay and a cymaphen (a sort of telephone); also had a considerable share in the success of the second Atlantic cable.

Varley, John (1778-1812), an English water-colour painter, born at Hackney in London, but spent many years amid the picturesque and in-spiring scenery of N. Wales. He ex-hibited in the Royal Academy and assisted in the foundation of the Society of Painters in Water-colours. Among his pupils were John Linnell and William Hunt.

Varna (ancient Odessos or Tiberio-

garia, on W. shore of the Black Sea, chief port between Kustendje and the water. Bosporus. Meat, grain, and leather are largely exported. The Turks defeated the Hungarians in a battle here (1444). Pop. (dist.) 329,612; here (1444).

(tn.) 41.419. Varnhagen von Ense, Karl August (1785-1858), a German author, born at Düsseldori. He first studied at Düsseldorf. He first studied medicine, then joined the Austrian army, and was wounded at Wagram, Later he entered the Prussian Civil Service at Berlin and again in Paris. and also fought in the Russian army. He married Rahel Antoine Friedea christianised Jewess (née Levin) and a remarkably cultured woman, who gathered round her the chief men of letters and savants of her day. V. is chiefly famous as biographer; among his works at

Biographischpondence with I has also been

published.

etc.

Varnish consists generally of a solution of resin in a solvent such as solution of resin in a solvent such as liesed oil or alcohol. The nonvolatile drying oils (c.g. linseed oil) Vasari, Giorgio (1511-74), an Italian historian of art, was famous in which the resinous material (copal, enjoyed the patronage of Clement VII. amber, etc.) is dissolved in a solvent among others. Yet to-day his picamber, etc.) is dissolved in a solvent among owners as alcohol or benzole. After tures, including the mural and ceiling application the solvent dries away decorations in the Palazzo Vecchio, and leaves a thin coating of the and leaves a thin coating of the which is apt to crack. Oil Vs. the non-volatile drying oils as vents. The oil does not evaporate remains in the V., giving a toughness to the resingus film. See French POLISHING, JAPANNING, SHELL-LAC,

Varnish Tree, the name given to various trees, among which are Rhus coriaria, Mclanorrhæa usitatissima,

coriaria, Mainorrhea usuanssma, and Ailantus Glandulosa.

Varro: 1. Gaius Terentius, consul 216 B.C.; fought at Canne against Hannibal; ambassador to Philip of Macedon, 203, and to Syphax. King of Numidia, 200 B.C. 2. Marcus Terentius (116-28 B.C.), a Roman soldier. He fought for Pomper in the Civil War, but of the the helting of Physicalis was consulted to the consultation of the co but after the battle of Pharsalia was well treated by Cæsar, who made him his librarian. He was proscribed by the second triumvirate; and Antony destroyed his books and his villa, which were later restored to His chief works were satires after Menippus, poems, mock tragedies, Antiquitales.

good preservation, others mere fragments.

Indian god of day; also the god of

Varus: 1. Publius Atius, one of Pompey's generals in the Civil War against Cæsar. He destroyed Curio's army in Africa in 49 B.C., but after Cresar's victory at Pharsalia (48 B.C.) Scipio was given command in Africa; and was given command in Africa; and after the further defeat of Pompey at Thapsus, Varus joined Pompey's sons in Spain, and fell at the battle of Munda (45 B.C.). See Crosar, B.C. I., 12, 13, 31; Cic., Pro Ligario, L. 2. Publius Quintilius, a consul at Rome (13 B.C.), governor of Syria; about 7 A.D., sent to conquer and the establish himself in German. The establish himself in Germany. Germans revolted under Arminius, the Roman legions were annihilated, See Suct., Vita Tib., 16 (Vite

nerania, Prussia, rince Bismarck's country residence was here. Pop.

Vasa, Gustavus, see Gustavus. Vasarhely, Hódmezö, see 1

MEZO-VASÁRHELY,

2100.

ork of Michelan-

DЛ

Vascular Tissue, in anatomy, the arrangement of cells composing the capillaries, arteries, and veins. The capillaries, arteries, and veins. small arteries are composed of oral endothelial cells with oval nuclei and serrated edges. A small proportion of intercellular cement fills up the spaces between the cells, sometimes forming spots known as stigmata and stomata. In the larger blood vessels a sheath of connective tissue lies outside the endothelium.

Vase, a hollow vessel, usually decorated and decorative, made of metal, stone, glass, or carthenware. Ancient vases made by the Expelians, Phomi-cians, Greeks, Etruscans, Romans, Chinese, or Japanese are of great his-

toric as well as artistic value.
Vaseline, or Petroleum Jelly, the
aixture of hydrocarbons which disils over from American petroleum etc., some in above 300° C. It is purified by filtration through animal charcoal, and

ents. forms a soft odouriess solid melting Varuna (cf. Gk. 'Opparés'), the ancient at about 50° C. Acids and alkalies

have little effect on it, and it is used largely as a lubricant. V. is used as an unguent, and is employed in the preparation of ointments.

Vasilkov, a tm. of Russia in the gov. of Kiev, 23 m. S.W. thereof. It was founded in the 10th century; and has a trade in cattle, corn, tobacco, etc. Pop. 18,500.

Vassal, see FEUDALISM. Vassar College, New York, for the higher education of women, was founded by Matthew V. (1792-1868) in 1861. It is situated in grounds occupying 450 acres at Poughkeepsie, 3 m. from the Hudson R., and possesses a fine library, chapel, art gallery, hall of casts, etc. There are over 1000 students. See Lossing,

Vassar College and its Founder, 1867. Vasto, a seaport and tn. of Italy, in the prov. of Chieti, and 31 m. E.S.E.

in the prov. of Chiett, and 31 m. E.S.E. thereof. It is famous for its olives which are largely grown. Pop. 16,000.

Vatersay, or Watersay, a small island of the Outer Hebrides, 10 m. N.N.W. of Barra Head, in Inverness-shire, Scotland. After the 'V. Raid' the Congested Districts Board purchased it for orefters. chased it for crofters. Pop. 75.

Vatican, The, a huge pile of buildings in Rome, celebrated as the home of the popes since their return from Avignon in 1377. The chapel of San Nicholas V. (d. 1455), and the Apartamento Borgia from that of Alexander VI. (d. 1503). The Sistine Chapel (1473), with its masterpieces of Michelangelo, Botticelli, and Ghirlandia weekly work of Sixtya IV. dajo, was the work of Sixtus IV.; and the famous Loggie, of Julius II. (d. 1513). And thus through the centuries this vast irregular structure, which covers an area of 1151 ft. by 767 ft., and which embraces over 4000 rooms, besides eight grand staircases and numerous courts, halls, gardens, and galleries, has gradually spread; until to-day, even apart from the church, it is one of the most historic architectural records of the world. The actual residence of the pope was built under the direction of Sixtus V. (d. 1590) and Clement VIII. (d. 1605). The V. museum is the repository of the finest collection of Greek and Greeco-Roman sculptures in existence; whilst in the Pinacotheca and elsewhere will be found the choicest works of Raphael, Perugino, Domenichino, and Titian. The Library contains many priceless MSS, embracing Hebrew and Oriental besides classical collections. The Etruscan Museum is the achievement of Pope Leo XII. (d. 1829). It was at the V. that the famous Œcumenical Council assembled in 1869 when the Infallibility of the Pope was reasserted.

Vatke, Wilhelm (1806-82), a German theologian and higher critic, born at Magdeburg. Early devoted himself to theology and philosophy, becoming professor of theology at Berlin. Of his projected great work on Biblical Theology only one volume was published (1835), owing, it is by H. Benecke (1884).

Vatnajökull, a volcanic mountain in the S.E. part of Iceland, having an altitude of 5000-6000 ft.

Vattel, Emmerich (1714-67), a Syden in the S.E. County for the State of State o

(1714-67), a (1714-67), the Swiss jurist, born at Couret. The work by which his name is now chiefly known is his Droit des Gens or Law of Nations. This work has had a great reputation and has passed through

many editions. Vauban, Sébastian Le Prestre De (1633-1707), marshal of France, the most celebrated of French military engineers. In 1678 he became 'commissaire-général des fortifications ' and proceeded to strengthen the fron-tier defences, building the fortresses of Landau and New Breisach, etc., and rebuilding Strassburg (1681). But besides constructing or improving over 150 strongholds, he conducted forty sieges, including those of Lille (1662), Maestricht (1673), Cambrai (1677), Ghent (1678), Namur (1692), and Old Breisach (1703). His latter days were darkened by royal disclar displeasure and neglect, for which a rather revolutionary economic treatise was in part responsible.

Vaucher, Jean Pierre (1763-1841), a Swiss botanist, born in Geneva, and became professor and finally rector of the academy there. He published: Histoire des Conferves d'Eau douce; Histoire physiologique des Plantes de l'Europe; Monographie des Oro-banches; Souvenirs d'un Pasteur

Genevois.

Vaucluse, a dept. and administrative div. of S.E. France, is divided into two regions: the valley of the Rhône. which consists of plains and level country; the other mountainous and including the chains of the Lure and the Luberon. The climate of V. is healthy and mild, except in the seasons when the mistral ravages the country. One of the principal cultivations of the dept. is madder, for the growth of which the soil is not the growth of which the soil is particularly fayourable, especially near Avignon. Wheat and other cereals are also grown. V. furnishes good wines for the market, notably those of Sorgues. The cap. of the dept. is Avignon. Pop. 238,656. Area 1381

sq. m. Vaud, a canton of S.W. Switzerland. triangle, the base of which extends along one of the shores of Lake

Geneva. The chain of the Jura Mts. | hurst, thence went to a Jesuit school the dukes of Zaebringen, and the house of Savoy. It did not become an independent canton until 1798. The soil of V. is generally fertile, and is largely under cultivation. Wine, herbs, tobacco, clocks, and condensed milk are among the chief objects of industry or export. Lausanne. Pop. 315,428. Cap.

Vaudeville, a play in which dialogue is interspersed with songs. The word is a corruption of Vaux de Vire, the name of two valleys in Normandy. In the 15th century one Olivier Basselin, of Vire, composed a number of drinking songs, which spread over France, |

bearing the name of their native place.
Vaudois, see WALDENSES.
Vaughan, Charles John (1816-97), headmaster of Harrow and dean of Llandaff; second son of Edward Thomas Vaughan, vicar of St. vicar of St. First educated Thomas Vaughan, vicar of St. Martin's, Leicester. First educated by his father, on the death of the latter he went to Rugby, and thence to Trinity College, Cambridge. He graduated as B.A. in 1838, and as M.A. in 1841, obtaining his D.D. in 1854. V. was ordained in 1841 and appointed to his father's former parish. In 1844 he was chosen for headmastership of Harrow wh headmastership of Harrow, wh position he held with distinct until his resignation in 1859. He want to Doneaster in 1869, but accepted in use among the Egyptians in the 4th the mastership of the Temple in 1869, millennium n.c. It is almost always and subsequently the deanery of of semicircular cross-section. The works and sermons were published by him; his first volume being Memorials of Harrow Sundays, 1859. He died Oct. 15.

Vaughan, Henry (1622-95), a Welsh poet, born i nock, and a

the ancient Silurist. London, he

at Brecon and Newton-by-Usk. at Brecon and Newton 5, onthe Salire first book. Poems, with the Tenth Salire

was surreptitiously published in 1001. About this time he had a serious illness which led to deep spiritual impressions, and thereafter his writings were almost entirely religious. Siler Scintillans (Sparks from the Flint), his best known work, consists of short poems full of deep religious feeling.

Vaughan, Herbert Alfred, Cardinal (1832-1903), the eldest son of Colonel John Francis V., was born at Glouces-

outs through the canton of V. in a at Brugelette, Belgium, and atters. S.W. to N.E. direction. The territory wards to Rome in 1851 to study for V. was owned successively by the French, the emperors of Germany, tion, V. was chosen to succeed Dr. Turner as Bishop of Salford in July 1872. 1872. On the death of Manning in March 1892, he was appointed Archbishop of Westminster, and cathroned at the pro-cathedral, Kensington, on May 8. The following year he received a cardinal's hat from the hands of Leo XIII. In July 1894. V. started his great project for erecting a cathedral at Westminster, which he lived just long enough to see consummated; his funeral service there on June 25, 1903, being coincitive of the building. (1795-1865), a

was pastor at ad in Kensing-also held the chair of history in University College, London (1834-43), and was president of the Independent College at Man-chester (1843-57). He founded the British Quarterly in 1845, and pub-lished: Life of Wycliffe, 1828: History of England under the Stuarts, 1840; Perceluling in History, 1859-63

Revolutions in History, 1859-63. Vault, an arched covering to a building, formed of brick, masonry, or other strong material. The chief or other strong material. The chief varieties of Vs. are the barrel, the

id was

Llandaff in 1879. Numerous religious groin V. is formed from the Interworks and sermons were published by section of two barrel Vs., and so can him; his first volume being Memo-only be used in a square apartment. He By the addition of ribs at the groins there arose the Romanesque vaulting, which later gave way to the pointed Gothic ribbed Vs.. of which specimens are common throughout the country. For these and certain peculiar forms, see Sturgio's Dict. of Architecture.

1 ... 40 Clapiers. ench writer de Clapiers,

who was made a marquis in 1722 Born at Aix. In 1741 he was in garrison at Metz, and during the terrible retreat from Prague had both less badly frost-bitten. Ruined in health, in 1745 he settled quietly at Paris, and devoted himself to literature. Among his principal works may be mentioned a volume of Maximes, Introduction à la Connaissance de l'Esprit humain, Réflexions critiques sur divers Poèles, and Caractères. The Fig. 3), the eldest son of Colonel Eurres completes de Vaurenargues Francis V., was born at Glouces- were published by C. de Saint-He was first educated at Stony- Maurice (Paris), 1821; and a new

Vauxhall, a dist. of London in the bor. of Lambeth, formerly famous for its gardens, which were opened in 1660 (see *Vanity Fair* by Thackeray, and Pepys' *Diary*) and closed in 1859. Vauxhall Bridge is one of the fourteen road bridges over the Thames in the county of London, and lies between Lambeth Pridge and the tween Lambeth Bridge and the Grosvenor Railway Bridge.

Vavasour, a feudal term for one who held his lands from one of the higher nobility, and not directly from

the crown.

Vecchi, Giovanni Dei (1536-1614). an Italian painter, worked with Zaddeo Zuccheri on the palace of Caprarola at Rome, and also executed 'Martyrdom of St. Lawrence,' and a fresco of the 'Four Doctors of the

Church.

vecchia, Pietro Della (1605-78), an Italian painter, born at Venice. He executed several works in imitation of the old masters, and copied in oil the historical works in mosaic which are in the church of St. Mark. also painted the 'Crucifixion' for the same church, besides various celebrated pictures of armed soldiers and banditti.

Vecelli, Francesco (1483-1560), an Italian painter, was the brother of Titian, whose jealousy he excited by his 'Transfiguration' for S. Salvatore. But his best picture is a 'Nativity' in the church of S. Gluseppe at Belluno. Other works are: 'Virgin Enthroned, with SS. Jerome (Berlin); E Peter and Ecce Homo Annunciation' The (Dresden);

(Venice).

Vector and Vector Analysis. An outcome of the theory of quaternions (q,v), of which it may be said to be a simple application to many problems in practical mechanics and physics, enabling more rapid conclusions to be obtained by simplified processes. V. is a geometrical quantity which is related to a definite direction in space: magnitude, direction, and sense are required specifications. If two Vs. are placed so that the beginning of the second coincides with the end of the first, then the V. from the beginning of the first to the end of the second is the sum of the Vs. A similar process applies to any number of Vs., and the mathematical lines. A simple geometrical application will serve as illustration:—To prove that the three medians AL, BN, CM, of any triangle ABC intersect at O and divide appropriate the relief divide one another in the ratio of 1 to 2. In this simple case let $\Delta O = a$, $LO=t_{1}\alpha$, $OC=\gamma$, $MO=t_{2}\gamma$; then agreeable traits. They m $BM=MA=t_{2}\gamma+\alpha$, $BL=LC=t_{1}\alpha+\gamma$; with the Cingalese in trade.

edition, ed. by D. L. Gilbert (Paris), then $BO = 2t_{\gamma}\gamma + \alpha = 2t_{1}\alpha + \gamma$, whence 1857. V. died in Paris. $t_{2}=t_{1}=\frac{1}{2}$. $BO = \gamma + \alpha$, but ON = Vauxhall, a dist. of London in the $(\gamma + \alpha)/2$, so BON is a straight line, and since BO is twice ON, the medians divide one another in the ratio 1/2. In this example the small letters represent Vs., and it will be noticed they are used directly and not noticed they are used directly and not with reference to co-ordinates. The V. product $(a\beta)$ of two Vs. $a+\beta$ is a V. perpendicular to both, its length represents to scale the area of the parallelogram generated by moving the second V. along the first, and the area is taken in the sense of the first. V. The scalar product $(\alpha\beta)$ of two Vs. is the area of the rectangle contained by a and the projection of son it, and is a scalar. The former is often represented $ab \sin \theta \epsilon$, the latter $ab \cos \theta$; where a and b denote the lengths of a and b, θ the included angle, and ϵ the ort giving the aspect of the area. In the electro-magnetic theory of radiation the method is now chiefly See Henrici. Vectors and nsed. 1903: Wilson and Rotors. wurds, 1903; Wilson and Gibb, Vector Analyses, 1901: Heaviside, Electrical Papers, 1892; Bucherer Element der Vettor Analysis, 1905.

Veda and Vedism. Veda is the general term for the ancient sacred literature of India. The oldest and most important mark in the Div Nota

most important work is the Rig Veda, which contains about 1000 hymns or religious lyrics dedicated to the greater gods of the Vedic pantheon, extolling their deeds and imploring them to come to the sacrifice. The hymns are divided into ten books. and were probably composed between 2000 and 1000 B.c. The Sama Veda is a collection of the words to be used at the soma sacrifice. The Vedic at the soma sacrifice. The Vedic literature was the written expression of Vedism or the revelation of the selfexistent Being by means of the Rishis.

Vedanta, Uttara - Mimamsa, Upanishad, a system of Brahmanic philosophy which in its main features carries on the speculations of the older Upanishads; e.g. God is the sole order Opanishaus; e.g. God is the sole real existence. He is both Creator and Nature, and all things are resolved in Him; the individual soul proceeds from Him and ultimately returns to Him; it is not a free agent, but is ruled by God, and its sufferings depend upon its bodily organs. These are the main features, but later Vedantists established other theories. e.g. Sankara-acharya maintained that the material world had no real existence, and Madhva-acharya claimed that the supreme spirit was distinct from man and matter.

Veddalis, a people of the remote parts of S.E. Ceylon. Their civilisation is primitive, but they have many agreeable traits. They mix freely

Vedder, Ehihu (b. 1836), an American painter, studied in Paris under Picot, and also in Italy. Some of his pictures are in America; the Boston Art Gallery possessing his 'Lair of the Sea Serpent.' His illustrations to the Rubáiyát of Omar Khayyan are Dict; and the periodicals, the Vegetarian Messenger (monthly).

Renatus r., wrote to books, hich apwell known.

Vedettes, mounted sentinels posted the middle ages and later it was rein advance of the main army.

Veen, Maertenvan, sec HEEMSKERK, MAERTEN JACOBSZ.

Veendam, a vil. of the Netherlands, about 15 m. S.E. of Groningen. Pop.

about 15 m. S.E. of Groningen. Pop. (est.) about 11,000.

Vega (a Lyre) was the pole star of the 12th and 13th millenniums B.C., and will attain the same position in the 15th and 16th A.D. Huggins attempted to photograph its spectrum in 1863, but Draper succeeded in 1872. It is a Sirian star of magnitude 0°2, parallax 0°16", with a distance of 20°4 light years, and is proproaching the sun at 10 m. per sec.

a diseance of 20'4 light years, and is approaching the sun at 10 m. per sec. Vega Carpio, Lope Felix de, see Lope, Felix de Vega, Garcilaso de la, see Garcilaso De La Vega.

Vegetable Marrow, the fruit of an annual trailing gourd (Cucurbia Pepo cuffera) much group, in cottere and ovifera) much grown in cottage and other gardens for use as a vegetable

and for making preserves.

Vegetable Physiology, see Plants. Vegetarianism, the practice of re-stricting the diet to food of vegetable origin. În general, vegetarians may be divided into two schools, the economical and the philosophical. former aspect treats of the food value of vegetable products as compared with flesh foods. It is with flesh foods.

that all the essential ingre wholesome diet are contain

selected vegetable foods, time less danger of disease than in a flesh-diet, that a liberal allowance of nutridiet, that a liberal allowance of nutritious food can be obtained at a compractively low cost, and that the encouragement of vegetable food production would simplify many social problems and provide a healthful occupation for many people. The philosophical aspect treats of the relationship between food, morality, and the facts of evolution. It is de-monstrated that it is consistent with the trend of evolution that man should live on a vegetable diet, or to put it differently, man was intended by nature to be vegetarian. It is con-tended that it is inconsistent with man's position as a moral animal to prey upon the lower animals, that the elements of brutality are fostered by the associations of a fiesh diet. In this way the tenets of vegetarians have in many instances been exalted into a creed of a semi-religious nature. See Howard Williams, The Ethics of

During

cognised as an authority on the conduct of war.

Veglia, an island off the coast of Dalmatia, belonging to Austria. Tho chief town is Veglia, a small port. The surface of the island is mountainous and not very well suited for cultivation. Area 146 sq. m.

Vehmgerichte. These were tribunals Camany, and during the

largely cur-n the 16th Bonaparte century, and Jerome Bonaparte formally slew the dead institution in 1811. From the emperor these courts derived a power over life and death. Their jurisdiction, administered much the same as in the ordinary courts, was in the hands of a society to which all freemen were eligible. The process of initiation, secret signs, and passwords remind one of freemasonry; and the elaborate system of esplonage and the procedure observed in certain trials which, contrary to the usual custom even in the V., were conducted in camera, recall the methods of the Russian police.

Veil was an ancient city of Etruria, some 10 m. N.N.W. of Rome, and lying on a plateau near Isola Farnese. Until it was razed to the trust of the continuous after a ten years' t was a formidable

: :, see Al-Hakim-inn-

tha he tissues to t... they are composed of three coats, lunica adventitia, tunica media, and tunica intima, but in general there is less muscular and elastic tissue. The V. are generally divided that are generally divided into three are generally divided into three systems: the general venous system, the pulmonary system, and the hepatic portal system. The general venous system returns the blood from the greater part of the organism to the heart. The pulmonary system brings back the oxygenated blood from the lungs to the left ventricle of the heart. The hepatic portal system carries the blood from the stoward. carries the blood from the stomach-intestines, spleen, and pancreas to the liver by the portal V., ramifying into numerous capillaries. The pulmonary and hepatic portal V, have no valves. Veins, in geology, see DYKES.

man painter. He was the son-in-law of Frederick Schlegel. He studied his art under Matthaei at Breslau, and also with other masters in Rome. He worked with Cornelius and Overbeck in painting the frescoes of the Villa Bartholdy. In Mainz Cathedral some of his frescoes are to be seen.

Veitch, John (1829-94), a Scottish man of letters, was in 1864 appointed to the chair of logic and rhetoric at Glasgow. Besides History and Poetry of the Scotlish Border (1877), he published original poems and philo-

sophical works.

William (1794-1885), Veitch. Scottish classical scholar, assisted in the revision of Liddell and Scott's Greek Lexicon and Smith's Latin and English Dictionary, and published an annotated text of Cicero's De Natura.

Veile, a scaport at the head of Veile Fjord, in S.E. Jutland, Den-mark. Pop. less than 9500.

mark. Pop. less than 9000.
Velasquez, Diego (c. 1465-1523), a
Spanish 'conquistador,' is chiefly
notorious for his petty jealousies of
Cortes, whom he first entrusted with
the conquest of Mexico (1618), and whom he afterwards hindered and annoyed by every means in his power. Yet Las Casas represents him in an amiable light. He was governor of Cuba, which he had conquered

(1511-15).

Velasquez, Diego Rodriguez de Silva y (1599-1660), a Spanish painter, was a native of Seville, and learnt the rudiments of his art in the studios of Francisco Herrera and Francisco Pacheco, whose daughter Juana he married. From the day when Olivarez, King Philip IV.'s favourite, summoned him to Madrid, his life was an avenue ever leading him to better fortune, till finally (in 1651) he was burdened with the dignified office of 'Aposentador del Rey,' or court marshal to King Philip. His first visit to Italy and Rome, then as now the Mecca of the art student, covered the period 1629-31. He was intimate with Rubens and Ribera, and was chosen before the other court painters to commemorate 'The Expulsion of the Moors' from Spain (1629). Though he applied his master-hand to landscape, and to religious, classical, and historic painting, it was in portraiture that his genius and technique were both displayed at their highest. Thus, though all praise is due to his 'Surrender of Breda,' his 'Bacchus' (so little Hellenic as to have carned the sobriquet of 'The Topers'), to his 'Christ on the Cross,' and to 'The Water-Carriers'—it is his portraits of Philip IV. of Philip IV., which are legion, of Count Olivarez, and of 'The Maids of Honour' ('Las Meniñas'), etc.,

Veit, Philipp (1793-1877), a Ger-which have won for V. his proudest an painter. He was the son-in-law eminence. Murillo, Juan de Pareja, and Juan del Mazo were his pupils.

Velocity

Velbert, a tn. in the dist. of Düsseldorf, Rhenish Prussia, about 8 m. N.W. of Barmen; manufs. hardware. Pop. about 23,000.

Veldes, a tn. of Carniola, Austria, 20 m. S.W. of Klagenfurt. It has a spa and is a summer resort.

2000.

Veleia, an ancient city of Italy, at the base of the Apennines, 45 m. from Parma. The town was destroyed about the end of the 4th century B.C. by a fall of earth and rocks. Excavations were begun in 1760.

Velez Blanco, a tn. of Andalusia, Spain, in the Velez Rubio dist., 64 m.

N.N.E. of Almeria.

Velez de Guevara, see GUEVARA,

Luis Velez de.

Velez Malaga, a tn. and prov. of Spain, 16 m. E. by N. of Malaga. Produces fruits, particularly raisins, and olive oil. Pop. about 23,600. Velez Rubio, a tn. in prov. of Almeria, Spain, 20 m. W. of Lorca, a the Computative Box.

in the Sierra Maria Mountains, Pop.

10,109.
Velij, a tn. of W. Russia on the W. Dwina, Vitebsk gov. Is a river port, and carries on various industries.

Velleius, Paterculus, see PATER-CULUS.

Velletri, a tn. in Italy, 28 m. S.E. of Rome, formerly belonged to the papal states. V. is the seat of a bishopric, and is an old and picturesque place built upon a hill. There is an interesting municipal palace, and the gardens of the Lancelloti Palace are famed for their beauty.

Vellore, a tn. of British India in the prov. of Madras. Manufs. are cotton and indigo. The town is defended by three forts, and has a military

barracks.

Vellozia, a genus of tall perennial plants (order Amaryllidaceæ), with large white or blue flowers, sometimes grown in the stovehouse.

Vellum, see Parchment.

Velocipede, see CYCLES AND CYCLING.

Velocity is defined as the rate of displacement of a moving point. It is sometimes applied to the rate at which a change of state or configuration may take place in bodies. To specify V. completely, the direction as well as the rate at which the body is moving must be given, and hence it is a vector quantity. To determine the V. of a body, the distance passed over by the body is divided by the time it takes. This gives the average V. over that distance. If the V. is not uniform the instantaneous V. is required, which necessitates the use of the differential calculus. The unit of V.

is defined as that V. with which a mode of self-redress by which fellow-

Velsen, a vil. in prov. of N. Holland, Netherlands, 1 m. from the North Sea and 6 m. N. of Haarlem.

Velvet (Lat. villosa and) a fabric believed to have in the East, possibly in surface is a short thick pile, produced

by weaving a second set of warp threads over the already woven cloth, these threads being passed over wires and cut before the wires are removed. V. is made of pure silk, a similar material with a cotton back and silken face being termed vol-veteen. It is largely used for rich draperies and hangings: like stage curtains, church vestments, royal and ceremonial apparel, and, indeed, all manner of sumptuous attire. royal It is heard of as early as the 13th century, was first used for napkins and the mantles of knights templars, and is mentioned in a sumptuary law of Henry IV., which forbade any 'man not being a banneret, or person of higher estate' to wear 'velvet or motley velvet.' The expression higher estate to wear veryor or motley velvet.' The expression 'motley velvet' is clearly an allusion to the rich brocades with V. piles introduced into their patterns, and perthoused also to the diaper designs produced by piles of varying length (pile upon pile). Up to the 16th century the finest Vs. were woven on the looms of Genoa, Venice, and Florence, To-day Crefeld and Lyons are two react centres of production. V. is great centres of production. V. is still fashionable by reason of its rich and glossy surface, on which there never lacks a gentle play of light and shade.

Venaissin, an ancient dist. of France, between Durance and the Rhone. Cap. Venasque.

Vendace, or Coregonus vandesius, a small fresh-water fish of the salmon family, allied to the powan and pollan, found only in a few lakes in Dumfriesshire and in some of the English lakes. It was formerly much valued as a table delicacy.

Vendée, La, a maritime dept. of W. France, comprising three divisions, viz. Bocage (woodland), Côte (plain), and Marais (marsh). The first named occupies the greater portion of the department. of the department. Agriculture is the chief industry, and wheat the most important crop. Pop. 442,777. Vendémiaire

age), a name month of the ye calendar during tion, extending about Oct. 24.

moving point passes over unit distance in unit time, e.g. foot per sec., cm. per sec. ance for any personal injury done to a member of their clan or family. The V. is narrower than the old blood feud in that vengeance is only exacted in the single case of a murdered It exists or did exist until

Corsica (see Prosper vel, Colombo) and in in novel, Colombo) a Corsican legislature endeavoured with some degree of success to put a stop to the practice many years ago by prohibiting the carrying of arms, but that law having been repealed, the number of murders has since been on the increase.

Vendôme, a tn. in the dept. o Loir-et-Cher, France, 20 m. N.N.W of Blois. It was formerly the capital of a county, which was afterwards raised to a duchy, and the dukes resided in its ancient castle. Manufs. woollen and cotton goods.

9800. Vendôme, Louis Joseph (1654-1712), vencome, Louis Joseph (1654-1712), a marshal of France; son of Louis, second Duke of V., and great-grand-son of Henry IV. Born at Paris. First saw service in the Dutch campaign of 1672, and in the war of the Grand Alliance served with distinction at Steinkirk and Marsaglia. In 1702 he was p' Franco-Sr the ghting two unst Prince Eu the Austrians ... the Spanish campaign of 1710 he won his last victories. V. was one of the greatest of French generals and exercised an extraordinary influence over his men. See Marquis de Segur, Le Duc de Vendôme, 1913. Vendors and Purchasers. The law

concerning contracts for the sale of lan .

for

to: is commonly referred to as the law of V. and P.; though, of course, personal property can equally form the subject of such a contract. Contracts for the sale of interests in land are, however, of such intricacy and so hedged round with technicalities that it is always desirable in negotiating for sale or purchase to employ legal experts. (As to the form of such a contract, see under Contract; and Frauds, Statute of.) No contract for the sale of land will stand unless:

(1) It is quite clear what the subjectmatter of the contract is. In this connection if the subject-matter can be ascertained, mere uncertainty as to the exact measurements will not about Oct. 24.

Jof necessity invalidate the contract.

Vendetta, a modern survival of the (2) The price is fixed. A contract primitive custom of blood feud or for sale 'at a fair valuation' is enforceable: but if the mode of valuation be specified in the contract the court will not decree specific performance until the price has been ascertained by the means so specified. (3) All other essential terms are included. All the court requires is that the agreement contains the necessary terms upon which to base a formal conveyance; hence the omission of trifling details is immaterial. Where it is contracted to sell in addition to land (q.v.) the goodwill (q.v.) of a business, it is essential to specify the time for completion of the sale. The duties of a vendor are: (1) To show and make a good title to the land in accordance with the contract. Formerly he was bound to deduce a title for a period of sixty years pre-ceding the day of sale; but now by Vendors and Purchasers Act. the vendors and Furchasers Act, 1874, forty years' title, in the absence of any stipulation to the contrary, is substituted for the period of sixty years. But even in this case the 'abstract of title' (i.e. the history of the title showing the successive steps in its transfer) must go beyond forty years where necessary to arrive at a root of title, i.e. a point at which it can properly begin. A general devise by will or a disentailing deed is not, but a mortgage or purchase deed is a proper root of title. (2) To enter into a proper root of title. (2) To enter into covenants with the purchaser. The most important are: (a) that he has a right to convey the land; (b) that the purchaser shall have quiet enjoyment of the land; (c) that the land is free from encumbrances; (d) that he will make all 'further assurances' (i.e. conveyances) that may be necessary: and in the case of sale of leasehold (e) that the lease is valid and the rent paid. (3) To execute a proper deed of conveyance (q.v.) on the payment of the purchase money. It is for the vendor to bear the cost of supplying a proper abstract of title, and he must also bear the expense of getting in all outstanding estates (q.v.), and paying off encumbrances, and stamping all title-deeds. In the absence of express provision to the contrary the purchaser prepares and pays for the preparation of the deed of conveyance, though the vendor pays the costs of perusal. (4) To deliver to the purchaser all title-deeds in his possession or control. The duties of the purchaser are : (1) To peruse the abstract of title and make all his objections to it in reasonable time; (2) to prepare the deed of conveyance and deliver it to the vendor for execution; (3) on completion to pay the purchase money, or, if a deposit has been paid (as is usual by way of guarantee of good faith) the residue of the purchase money, together with; pressure needs to be reduced.

any interest due for delay; and (4) to enter into possession of the land so as to relieve the vendor from any fur-ther liability incident to ownership. Breach of contract by the purchaser entitles the vendor either (1) to bring an action for specific performance and join with the claim a claim for damages (q.v.); or (2) to sue at common law for the price; or (3) to take out a summons under the Vendors and Purchasers Act, 1874 (a summary remedy available only to decide questions as to title); or (4) to sue at common law for damages; or (5) to enforce his lien (q.v.); or (6) to resell and recover any difference in price from the purchaser; or (7) to sue for rescission. The purchaser has remedies corresponding to (1) (3) and (4) above; he may also sue (1) for rescission of the contract, adding a claim for the return of any purchase money paid; (2) to enforce his lien by claim-ing a declaration of his right thereto and an order for sale.

Veneering, the art of laying thin leaves, called veneers, of a valuable kind of wood upon a ground or foundation of inferior material, so as to produce articles of elegant appearance at a relatively small cost. Small-veneers are usually cut by hand, but larger ones by machinery.

Venema (or Venemas), Hermann (1697-1787), a divine, professor of theology at Francker in the Netherlands. He was author of the *Institutes of Theology* (trans. 1850), and of commentaries on various books of the Bible: Daniel (1752), Malachi (1759), the Psalms (1762-67), etc. This last work is rare and much valued on the continent.

Vener, the largest lake of Sweden, 87 m. long and 44 m. broad. It is very indented, and receives several rivers. Its shores are high and rocky in the N., open and shallow in the S., and are fringed by several islands.

Venereal Diseases, produced by sexual intercourse. See Gonorrhea

and Syphilis.

Venersborg, a tn. in prov. of Elfsborg, Sweden, 52 m. N.N.E. of

Gothenburg.

Venesection, or Phlebotomy, cut-ting of a vein in order to let blood. V., together with other methods, such as cupping and leeching, was the chief remedial measure of mediæval physicians. The underlying idea was the elimination the morbid of humours' causing disease, and the practice was resorted to in all conditions of ill-health, and even healthy subjects were bled to prevent the accumulation of supposed harmful fluids. In modern practice it is employed in conditions where the blood-

the elbow is usually selected.
Veneti, an ancient race who occupied Cisalpine Gaul in Northern Italy, around the delta of the Po. The Greeks called them Heneti, and they were supposed to have descended from a Paphlagonian tribe that settled in N. Italy under the leadership of the Trojan Antenor. They made alliances with Rome to protect themselves from Celtic invaders. On the conquest of the Cisalpine Gauls, the Veneti likewise became included under the Roman dominions. Many of their cities were plundered by the Huns under Attila (c. 450 A.D.); and the remaining inhabitants took refuge on islets off the coast, out of which Venice has since

Venetia, a territorial div. of N ern Italy, comprising the pro. Belluno, Padua, Rovigo, Tr Udine, Venice, Verona, and Vic

3,500,000.

Venetian Style, in architecture, a variety of Gothic developed in imitation of the 13th century style of Salisbury, Amiens, etc. Its peculiar features are treated most carefully in Ruskin's Stones of Venice. See also ARCHITECTURE.

Veneziano, Agostino, a Venetian engraver of the early 16th century. He was a pupil and assistant of Marcantonio Raimondi, and engraved many works, chiefly after Raphael. A fine collection of his works is pre-

served in the British Museum. Veneziano, Antonio (c. 1309-84), an Italian painter, born at Florence. He painted the walls of the councilhall at Venice in fresco; and a series, also in fresco, in the Campo Santo at Pisa, where his portrait, painted by

himself, is hung.

Veneziano, Domenico (c. 1406-82), being much lower in the dry scason. a Venetian painter, who according to Vasari was treacherously murdered by his fellow-artist and posed friend, Castagno. V.'s and cattle. This is

(Estados Unidos Venezuela Venezuela). This S. American republ of the R. Orinoco and the coastal plain surrounding the Gulf of Mara-catho, with a sea coast just within the caibo, with a sea coast just within the Caribbean Sea and therefore facing the E. Indian Is. E. of Cuba and Jamaica. It is within the same latitudes as Nigeria, Ceylon, and the Malay Peninsula, from 2° to 12° N. lat., washed by the N. equatorial current, and exposed to the N.E. trades, which have a more easterly trades, which have a more easterly trend for the summer months. The

median cephalic vein at the bend of average sca-level temperature varies the elbow is usually selected. average sca-level temperature varies from about 75° to 85° F., but like other tropical countries the range of climate coincides with elevation. Where ocean winds penetrate, the region is healthy, otherwise malaria and other fevers are common. In the E. lies British Guiana; W., Colombia; S., Brazil. The first portion of the mainland to be sighted by Colombus, it fell to the Spaniards, and its history is connected with the piracy and slave trade of the Spanish Main. 1830 it seceded from the republic of Colombia, and its present constitu-tion dates from Aug. 5, 1909. Con-gress consists of a chamber of deputies and a senate; the president holds office for four years and cannot be re-elected for the following term. Caracas is the seat of government.

> nearry 400,000 sq. m., four-nions of which forms part of the basin of the Orinoco. The valley between the maritime Andes and the Sa. Novada di Morida is the most densely peopled part of the state. E. and S. of this lies a densely-wooded, thinly peopled, and largely unknown mountainous region, separated from the Orinoco by llanos, grassy plains, or prairies, with wooded portions here and there. These llanos are uniformly level and largely flooded during the rainy largely flooded during the rai season; the delta and borders British Guiana are thickly forested and inhabited only by scattered Indian tribes. The Orinoco is navigable for large steamers for 375 m. to Ciudad Bolivar, the centre of the river trade, a place of 12,000 inhabitants, with stancer connection with Trinidad. Navigation varies greatly, the river being much lower in the dry season.

have been destroyed, but there e country, which is a picture by him in Santa Lucia de' mainly pastoral and agricultural in rariously

this: occupies the whole of the lower basin | promised to be a very flourishing cattle area is now largely denuded. cattle area is now maker.
There are 33,000 coffee estates in the republic; the export value (1911) £2,250,000. Cacao estates number arried on.

delta. Coal and petroleum are sought chiefly in the regions of Lake Mara-caibo and the R. Guasare. Maracaibo is an important distributing centre with a population of about 60,000; there are signs of enterprise in electric power, roads, and railways. There are less than 500 m. of railway in the states; from Guayra to Caracas, 24 m., British owned, as are also the 34 m. from Puerto Cabello to Valencia. From Caracas to Valencia. 111 m. are under German ownership: other lines are from Encontrada on Lake Maracaibo inland, one to Truxillo, and one to Barquisimeto. In 1911 the exports of V. attained a value of £3,750,000; imports, £2,850,000. Imports were obtained from Great Britain and the colonies, U.S.A., and Germany in the proportion of 32, 26, and 10 per cent and 19 per cent. respectively. Great and 19 per cent. respectively. Great Britain leads in cotton goods and agricultural machinery, U.S.A. in iron bridges and machinery. Of the population 10 per cent. are white, chiefly of Spanish descent; 70 per cent. mestizos, probably the largest proportion in any of the S. American states; the remainder Indians, negroes, and foreigners. Education is back. and foreigners. Education is backward and ill organised. It is possible that V. may benefit by the opening of the Panama Canal, but the social conditions must be improved and developed before much progress can be made.

See Foreign Office Reports (annual); Venezuela, Geog. Sketch, Natural Resources, Laws, etc. (Bureau of American Rep., Washington, 1904); Venezuela,

soul off from God entirely. See also

MORTAL SIN.

Venice (It. Venezia), a city of N. Italy, cap. of prov. of same name, 45° N., 12° E. It is built on an island, in-

of El Callao. There are also important and clocks, and at Murano glass and copper mines worked by an English glass beads. Its trade is mostly in company. Coal, iron, sulphur, mertransport, chiefly to the E.; in 1910 cury, and petroleum are other in the ships entered and cleared portant products, and pearl-fishing numbered 4353, of a total tonnage of is carried on along the coast. Iron is 2,200,000. The pop. in 1911 was obtained in the Imataca Mts. and the 160,719. The distinctive features of V. are its situation in the lagoon and the canals by which it is intersected, and by which all but foot traffic is conducted. Of its public buildings the following are the principal: the Ducal Palace, standing on the site of a former official residence of the Doges, which was burnt in 976. Be-sides its painted cellings and walls, there are many pictures by the Italian masters; the Accademia, whose twenty rooms are filled with some of the finest works of the Old Masters; the Museo Civico with its collection of antiquities. Its churches, amongst which the principal are St. Marco, St. Giorgio Maggiore, and Sta. Maria della Salute, are all most highly decorated with frescoes, mosaics, and carvings, besides containing many world-famed pictures. The Campanile of St. Marco has been rebuilt since its fall, on July 14, 1902, after standing a thousand years. The palaces of the nobility on the Grand Canal and other canals contain priceless collections of pictures. The Arsenal contains many models of the old Venetian ships, armour, collections of weapons, and spoils of war.

The arts in Venice.—The earliest art in V. was Byzantine, and V. lagged behind other Italian cities in forming a native style, but her masons, mosaicists, and glass workers soon mosaicisis, and glass workers foon became world famed. Amongst the foremost painters of the Venetian school are: Antonio Veneziano, the Vivarini, Jacopo Bellini and his sons and pupils, Carpaccio, Giorgione, Titian, Palma Vecchio, Sebastiano American Rep., Washington, 1904); Titian, Palma veccnio, Sebasuano andré, A Naturalist in the Guianas, del Piombo, and Pordenone. During 1904; T. C. Dawson, The South the 15th century printing flourished American Republics, 1905; A. H. Keane, Central and South America, 1908; V. Spence, The Land of Bolivar, 1878; C. R. Enock, The Reps. of Central and South America, 1913. Manutius stands for the finest work Venial Sin, in Roman Catholic of his time as well as for the greatest coult off from God entirely See also History.—The history of V. com-

History.—The history of V. commences with the inhabitants of the plain to the N. of the Adriatic taking Italy, cap. of prov. of same name, 45° refuge from the incursions of bar-N., 12° E. It is built on an island, in-tersected by canals, in the lagoon to the W. of the Gulf of Venice at the head of the Adriatic. V. was noted for its textile manufactures as early active and it was not till for the its textile manufactures as early as the existence, and it was not till 568 that 15th century; the principal manufactures at the present time are to the mainland. At first the comtapestry, brocades, Venetian laces, munity were spread over twelve wood-carving, artistic wrought-iron townships on various islands, of which work, jewellery, bronzes, machinery, Rialto, now V., was not the most im-

their imports throughou tories in the Morea, at Constantinople, and in many of the coast towns of Syria, and acquiring territory the mainland, extending from the Adriatic to the Alps between the Mincio and the Po on the W., and the Isonza on the E. During this period she found a strong rival in Genoa, the next important of the Italian maritime states, and had to protect her shipping from the Dalmatian pirates, besides having many encounters with the empire and neighbouring mainland states. She took a leading part in the transport of the Crusaders to the Holy Land, and made vast sums out of this and her trading transactions. In the latter half of the 15th century, after gallant struggles, her decline commenced, of which the chief causes were the Turkish conquest of Constantinople. the discovery of the Cape route, and the rise of the great European powers and their dominance in Italy generally; but the end did not come till 1796, when Napoleon after the war with Austria, took possession of the town. Clance of Troning;

Μ. icl, Ver:c : H. om: ·is the

chiefly compiled.

Venice, Gulf of, the N.W. arm of the Adriatic Sea, on which is situated

the city of Venice.

Veni Creator Spiritus ('Come, Holy Ghost'), an early and very famous hymn for Pentcost, generally cribed to Gregory the Great. The translation in the Prayer Book ordination service is ascribed to Cranmer.

Venlo, a fortified tn., prov. of Limburg, Holland, on the Meuse, 43 m. N.N.E. of Maastricht. Has Has narrow, winding streets. Pop. about

Venn, Henry (1725-97), an English evangelical divine, born at Barnes and educated at Cambridge. Was ordained in 1747 and became successively curate of Clapham, and vicar of Huddersfield, and of Yelling in Hunts. He wrote The Complete Duty of Man, 1763; and Mistakes in

Religion, 1774.
Vennachar, Loch, in Perthshire Scotland, 2 m. S.W. of Callander. It is 31 m. long.

portant. After generations of struggle nected with grooved fangs. One with the Lombards and the empire, V. became not only the greatest maritime power in Italy, but one of the most powerful in the world trading poison-sacs connected with the jaws most powerful in the world trading poison-sacs connected with the jaws most powerful in the world trading poison sacs connected with the jaws most powerful in the far East and

provided with poison-Europe; founding colonies and fac- glands in the mouth, but the greatest danger from insect bites is the possibility of bacterial or protozoic infection. Insect poison is usually formic acid, and may be counteracted an immediate application of monia. The best treatment for ammonia. snake-bite is the injection of antivenine.

Venosa, a tn. in prov. of Potenza, Italy, the birthplace of Horace, 52 m. S.S.E. of Foggia. Pop. about 8503.

Venta, the name of three cities of cient Britain—Venta Belgarum, with which Winchester is identified; Venta Icenorum, probably Calstor on the Wensum, near Norwich; and Venta Silurum, near the site of the Cœwent, in Monmouthshire.

Venti, the winds, represented in classical mythology as the servants of Æolus who shut them up in his cave and only released them at his pleasure. The chief winds were Zephyrus (W.) of the springtime: Notus (S.); Borens (N.) of snow and tempests; Typhon, a destructive wind, the son of Typhœus; and Africus. They were represented in art as human bodies, with wings at the heads and shoulders.

Ventidius, Bassus Publius (fl. 1st century B.C.), a Roman general, born at Picenum. He began life as a muletcer and chairman; but was noticed by Casar, under whom he served in the Gallic and civil wars, and became tribune and senator. 43 B.c. he was elected consul, and in 39 joined Labienus in Asla and defeated the Parthians in three great battles. He celebrated his triumph in Rome in 38 B.C.

Ventilation. Pure air and good food are necessary to human life, and it is possible by adequate means of V. to

lives. -Air is composed chiefly of oxygen and nitrogen, but it is upon the oxygen that the heat and energy of our bodies des is also found

The late Sir that 1'5 parts

per cent. produced nausea, depression, headache. The permissible and headach. In permission quantity is about 6 parts per 1000 cubic ft. Gas while burning is a great polluter of the air, and it has been found that 8 cubic ft. of air is consumed by 1 cubic ft. of gas, as well as Venomous Bites. Some snakes are producing other impurities from the provided with poison-glands con-combustion of gas. It has been found

that 1000 cubic ft. of air contain '4. part of carbonic acid gas, and the breathing of persons produces on the average about '6 parts per 1000 cubic ft. These added together make 1.0 cubic ft. per 1000 cubic ft. of air. This is in excess of the standard mentioned above, namely, 6 per 1000 cubic ft. Each person requires 3000 cubic ft. of pure air per hour, and it is necessary to change the air several times during the hour to obtain this amount. This is the object of good V. Care must be taken to prevent draughts. and air that travels at a greater rate than 2 ft. per second will produce draughts. In practice it has been found impossible to obtain the above amount of air per person, and the following are the amounts usually for practical purposes: adopted Cottages, 250 cubic ft. per person; houses let in lodgings, 300 cubic ft. per person (for sleeping only); dairies. etc., 600 cubic ft. per cow; factories and workshops. 250 cubic ft. per person: factories and workshops (for overtime), 400 cubic ft. per person. A careful examination of many of the houses of the poorer quarters, and indeed of the better class, discloses the fact that a great number are overcrowded. Schools, 100-240 cubic ft. per child; public halls, 1200-1500 cubic ft. per person; hospitals, 1200-3000 cubic ft. per person. Two methods of V. are adopted: (1) natural: (2) artificial; and in each method due regard is made to the lighting and heating. In a short article like this it is impossible to deal with each system in any great detail. 1. Natural ventilation. — This

conducted by means of inlet and outlet tubes by natural methods. tubes.-These should be as free from bends as possible, and should be so arranged as to deliver the air into the room at a height of about 6 ft. so as slightly to warm the incoming air before it reaches the heads of the occupants. The size of the opening should be based upon about 24 sq. in per occupant. Many inlet devices are upon the market, among them being the Tobin tube, Sheringham and Leather inlet valves. Outlet tubes .-Hot air always rises and outlet tubes should be placed high up in the room. and as far away from the inlets as possible. The provision of inlets should be slightly in excess of that of

the outlets.

. Artificial ventilation.—This is the system by which the air is propelled into the room or the foul air extracted from a room by mechanical means. There are two systems adopted: (1) the plenum; (2) the vacuum. The the plenum; (2) the vacuum.

pumps, thus forcing out the foul air. The vacuum system is worked by using exhaust pumps, gas jets, or furnaces for extracting the foul air from the rooms and allowing the fresh air to take its place. When air is propelled into a room it should be slightly heated, and if it is to be used for a number of rooms, heating coils should be used to warm the air before it enters the rooms. Messrs. Boyle's system of V. has proved very effective and is used to extract the foul air by means of an exhaust ventilator in the roof, giving place to the fresh air which is admitted by inlet tubes and which is admitted by finet tubes and which can be purified by passing through cotton wool, and also be heated by having a small heating coil in each ventilator.

Fans.-Fans are used both for extracting the air from and for propelling the air into a room. The Blackman fan is a very powerful ex-tractor as is also the Stott fan. By the use of fans of given power, the exact amount of air can be produced or extr--' iê number

of pers :.--This is effected by withdrawing the foul air from the tunnel at a point or points midway between the ends, and propelling fresh air into the space by means of powerful fans.

Ventimiglia, a tn. of Liguria, Italy, 9 m. W. by S. of San Remo. Has a fine Gothic cathedral, and the celebrated Balzi Rossi grottoes, containing paleolithic remains. Pop.

about 3452.

Ventnor, a tn. in the Isle of Wight on the S. shore. The climate is mild and suitable for invalids and consumptives. In summer it is a pleasure resort. The National Consumption

Hospital is just outside the town.

Ventriculites, a genus of fossil sponges with a funnel or top-shaped They are most abundant in the cup.

Cretaceous system.

Ventriloguism, the art of speaking such a manner that the sound appears to be produced at a distance from the speaker. The origin of the word, from venter, belly, suggests that the voice was supposed to proceed from the speaker's stomach. The words are, however, produced in the usual manner, though some consonants may be masked by the immobility of the lips and teeth and the restricted use of the tongue. The art was practised by the ancient Greeks and Egyptians, and has had various uses, from mere entertainment to religious charlataury.

Venue. In an indictment the V. is the statement of the county or other plenum consists of forcing purified geographical division from which the air into the rooms by fans or air sheriff has summoned the grand jury by whom a 'true bill 'has been found the case of Mars, very much more (see INDICTMENT, and JURY), and also, as a rule, the place where the crime was committed. As the V. obscure, but possibly definite, markshould, by the common law, be the ings near the rather shaded terriving diction within which jurisdiction within which was committed, the tria

takes place there too. general rule there are exceptions, c.g. offences committed by persons on a British ship (see Merchant Shipping ACT) may be tried in any county where the offender is in custody, offences against the Customs Acts are triable in any county; again the V. as to forgery, bigamy, larceny, or em-bezzlement by public servants may be laid either in the county where the crime was committed, or in the place of arrest; and there are special rules applying where the offence was committed partly in one and partly in another county.

Venus, the most conspicuous and brightest planet. Phosphorus, the morning, and Hesperus, the evening star, was its name among the Greeks. It is visible in daylight. It moves at a mean distance from the sun of 67.2 million miles in an orbit of less eccentricity, '007, than that of any other planet, at a velocity of 22 m. per sec.; the revolution is completed in 235 days, siderial period, its synodic period being a year and seven months. Its are of retrogression is 16°, the inclination of its orbit 3½°. The apparent diameter varies from 11 to 67 sec., its distance from the earth varying from 26 to 160 million miles. The real diameter is 7700 ± 30 m., the planet being practically the same size as the earth therefore, and her mass is 82 per cent., density 88 per cent., superficial gravity, 85 per cent. that of the earth. Owing to her position within the earth's orbit V. exhibits phases; the discovery of the Gibbons phase by Galileo in 1910, being one of the facts which disproves the Ptolemaic system, and supported that of Copernicus. The transit of V., its passage across the sun's disc at inferior conjunction, is a rare phenomenon, and occurs at or about nomenon, and decement of about cither June 5 or Dec. 7; actual past or future dates are Dec. 7, 1631; 4, 1639; 9, 1874; 6, 1882; June 5, 1761; 3, 1769; 8, 2004; 6, 2012. Horrox and Crabtree in England were the first (1639) to observe a transit, since then they have been specially observed elaborately by scientific expeditions to the best stations. The matter is of great importance as one of the im-

together with irregularities

im are the bases of any de-The undoubted presence of an atmosphere renders observa-tion difficult; a thin line of light when the planet is near the sun, and ex-tension of the horns beyond the diameter indicate an atmosphere, but less extensive than that of the earth. Faint lights on the dark portion of V. have also been recorded. rotation period is still undecided. Shroeter gives 23 hrs. 21 min., but Schiaparelli and Lowell (1896) give 225 days, the period thus corresponding with that of revolution as in the case of the moon. The longer period is supported by the fact that no sensible difference has been observed in the lengths of diameters of the planet.

Venus, see APHRODITE.

Venusberg, in German mythology, a cave palace among the mountains, where Venus held her court. The knight Tannhäuser dallied there Tannhäuser until he was satiated with its sensua. He later received absolution from Pope Urban.

Venus's Looking-glass (Specularia speculum), a campanulate plant with purple flowers often grown in garden

borders and beds.

Vera, a tn. of Navarra prov., Spain, cap. of dist. of same name. Is a small port.

Vera, Augusto (1813-85), an Italian philosopher, born at Amelia in Umbria, land ar sophy :

of Introduction a ta Phaosophie ae Hégel, 1855, and Strauss et l'Ancienne et la Nouvelle Foi, 1873. See mono-graph (1887) of Mariano.

Vera Cruz, a state and scaport town Mexico. The state extends for a in Mexico. distance of about 435 m. along the Mexican coast, N.W. to S.E., and covers an area of about 29,201 sq. m. It is watered by several rivers, mostly navigable, and there are several ports on the coast. The mostly navigable, and there are several ports on the coast. The climate is hot; and the chief products climate is not; and the enter products are coffee, sugar, cotton, rum, and tobacco. Jalapa is the capital of the state, of which the pop. is about 981,030. The city of V. C. is situated on the Gulf of Mexico, and is the chief port of the republic, being connected by rail with Mexico city. It has wide, well-tent streets and a flue cathedral. portain means of determining the by rail with Mexico city. It has wide, parallex (q.v.) of the sun. Surface markings.—Nothing is yet determined with any certainty, but it is mined with any certainty, but it is mined with any certainty, but it is midst of marshy or arid ground. The quite possible there are ice caps and mountains. Mr. Lowell is here, as in the end of the last century. The chief industry is fishing. Pop. about 1

29,164. Verapoli, a tn. of Madras, India, in the Travancore state, 9 m. N.E. of Cochin. It is the seat of a Carmelite mission and of the vicar-apostolic.

Veratrine, a poisonous crystalline powder derived from sabadilla seeds by bruising, boiling in alcohol, and precipitation with an alkali. It is sometimes used externally as a local angesthetic.

Veratrum, or False Hellebore. genus of perennial plants (ord. Liliacem) with decorative leaves, and panicles of white, green, or purple flowers. V. album yields the poisonous powder known as Hellebore powder, which is mixed with water and used as an insecticide.

Verawal, a seaport on the S.W. coast of the Kathiawar Peninsula, India, 40 m. N.W. of Diu. Pop. 17,500.

Verbaseum, see MULLEIN
Verbana, or Vervain, a genus of herbaceous plants and shrubs. V. officinalis is the common British wavside plant, with slender spikes small lilac flowers. A number of A number of species are grown in the garden, as numerous lemon-scented V. is Lippia or Aloysia citriodora.

Verbenaces, a natural order of trees, shrubs, and herbaceous plants, mostly tropical. The most important is teak (Tectona grandis). Many

species are fragrant. Verboeckhoven, Eugen Joseph (1799-1881), a Flemish painter, born at Warneton in W. Flanders. He chose Warneton in W. Flanders. his subjects principally from peasant and outdoor life, and was particu-larly skilful in painting sheep and cattle.

Vercelli (ancient Vercellæ), a tn. with considerable commerce in rice, on the Sesia, 121 m. S.W. of Novara by rail, in Piedmont, Italy. The library contains the valuable Codex Vercellensis (q.v.), and there is a 16th century cathedral. Pop. (1901)

17,922. Vercelli Book, or Codex Vercellensis, vercein Book, or codex Vercellensis, an Early English MS., which was discovered in 1822 by Dr. Friedrich Blume, a German jurist, in the cathedral library at Vercelli (q.v.). It appears in C.W. M. Grein's Bibliothek der A.S. Poesie, vol. ii. (Leipzig, 1904). Besides six homilies and a prose 'Life of Guthlac,' it contains six poems, including 'Andreas,' the 'Dream of the Rood,' and an 'Address of the Soul to the Body.'

Vercingetorix, a brave Gallic cham-pion, who, as chieftain of the Arverni, boldly defied Cæsar till he fell into his hands on the capture of Alesia (52 B.C.). After adorning Cæsar's triumph of

45 B.C., he was put to death.

Verd-Antique, the old French name for what the Romans called lanis atracius, from Atrax in Thessalv, its place of origin. It is a fine green ser-pentine mixed with limestone, varie-gated often with brown or white patches. The columns of the Lateran basilica are composed of this stone.

Cape, see CAPE Verde. ISLANDS.

Verden, a tn. with breweries and cigar factories, 21 m. by rail S.E. of Bremen on the Aller, in Hanover, Germany. There is an ancient ancient Pop. less than Gothic cathedral. 10,000

Verdi, Giuseppe (1813-1901), an Italian composer, born at Parma, studied under Provesi and Lavigna; studied under Froves and Lavigna, first opera, Oberto (1838), given at La Scala, Milan, with great success, followed by Ernani (Venice 1844,) and several others. Just before 1850, he travelled to London and Paris; on his return to Italy he wrote: Rigoletto, 1851; Il Trovatore, 1853; La Traviata. 1853; Un Ballo in Maschera, 1859; and Don Carlos (Paris, 1867). Under the influence of Wagner, V. excelled his previous efforts by Aida (Cairo, his previous energy by Ataa (Carro, 1871); Otello, 1887; and Falstaff, 1893. V. formed the connection between Rossini and Wagner, and his tradition was followed by Puccini. His Mazzini-Requiem (1874) must also be mentioned. See Life by

Sir A. C. Mackenzie, 1913.

Verdict. In civil trials, the jury, after the judge has summed up the evidence, determine by their V. all issues of fact, and, if they find for the plaintiff. assess the damages. Damages are said to be 'liquidated' when the jury can arrive at the amount by mere arithmetic or calculate them according to a scale of charges or some other accepted rate or percentage Odger's Principle of Pleading). when the amount is arrived at after consideration of all the circumstances, including the conduct of the parties, the damages are 'unliquidated.' the damages are uniquidated. In this latter case they may be contemptuous, when the jury think the plaintiff ought never to have brought his action; nominal, when, though the plaintiff was justified in suing, but has suffered no special damage, and has sued rather to clear his character as the bight substantial when or establish a right; substantial, when the plaintiff is entitled to fair compensation; and vindictive, when the jury desire to punish the defendant by making an example of him (this is only permissible in actions of breach of promise, libel, seduction, assault, malicious prosecution, false imprisonment, trespass, and slander). In criminal law Vs. are said to be either (1) general, i.e. guilty or not guilty; or (2) partial, i.e. guilty on one

count (see Indictment) and not guilty on the rest; or (3) special, i.e. where the jury finds a certain state of facts and leaves it to the judge to decide upon those facts whether the offence charged has been committed. In Scots law there is a middle V. of non-proven, but English jurisprudence has never favoured any rule that militates against finality one way or the other in criminal trials. Where the jury cannot agree they must be dis-charged and the accused is then tried before a new jury. If a juror dies or is taken ill a similar result follows. Before a jury arrives at a V. they ought to satisfy themselves (a) that the facts are satisfactorily proved; that the circumstantial (b) evidence (see EVIDENCE) is not only consistent with guilt, but is inconsistent with any other reasonable conclusion.

Verdigris, a poisonous pigment, consisting of basic copper acetates. It is used as a green or blue paint, and also in dye-works. The formula of blue V. is CuO2Cu(C3H2O3) 6H2O.

Verditer, a basic copper carbonate obtained when sodium carbonate is added to a solution of copper sulphate. It is greenish blue in colour, but is little used as a pigment as it is very poisonous and liable to discoloration.

Verdun, a tn., with sweet, liqueur, nail, and rope factories, and a canal commerce in agricultural produce and timber, on the Meuse, 40 m. W. of Metz., in the dept. of Meuse, France. A first-class fortress, V. faces German Lorraine with sixteen detached forts and twenty smaller works. The cathedral of Notre Dame is not very ancient; but the bishopric, the most famous occupant of which was St. Vanne (d. 525), goes back to the third century. It was here that the treaty authorising the three-fold partition of the Frankish empire was signed in Pop. (1906) 12,837. 843.

Vere, Sir Aubrey de, see DE VERE,

SIR AUBREY.

Vere, Aubrey Thomas de, see DE VERE, AUBREY THOMAS.

Vere, Sir Francis (1560-1609), an and passion for revenge. Many English soldier, brought up by Sir his novel entitled Maestro William Browne. His whole life Gesualdo (1889). from 1585 to 1604 was engrossed in active service, chiefly in the Low lands. He played a gallant part 1. the defence of Sluys (1587), the relic of Rheinberg (1589), the fights a Breda (1589) and Groningen (1594), the victories at Turnhout (1598) and

Vere, Horace, Baron Vere of Tilbury (1565-1635), an English soldier, was brother to Sir Francis V. (q.v.). As

commander of the English troops in Holland (1604) he recovered Sluys. In the Palatinate he was obliged to surrender to Tilly at Mannheim (1622).

Vere, Robert de, ninth Earl of Oxford (1362-92), an English great chamberlain, is notorious as one of the many favourites of Richard II. Being charged with treason by the lords appellant (1387), he made a futile effort to raise the standard of revolt and

eventually died abroad.

Vereeniging, a th. in the extreme
S.E. of the prov. of Potohefstroom,
in the Transvaal, S. Africa. It is
connected by rail with Pretoria and ontein. There are collieries It was the Treaty of Verceni-Bloemfontein. here. (1902), which concluded the ging

S. African War. Vereshchagin, Vassili (1842-1904), a Russian painter, graduated first in the list from the naval school of St. Petersburg, but subsequently studied art in that city and in Paris. A restless spirit all his days, he fought under Kaufimann during his Turkestan campaigns (1867), visited India, the Himalayas, and Tibet (1873), went through the Russo-Turkish War of 1877, travelled in Palestine and Syria (1884), was at the front during the Chino-Japanese War (1894), and finally perished with the flagship Petropavlovsk during the struggle between his country and Japan. His sensational pictures were painted with a view to disgusting people with warfare by confronting them with its horrors.

Giovanni (b. 1840), Verga, Italian novelist, a native of Catania, Sicily. According to Mr. Richard Garnett, his books will in time to come be treasured among the most valuable documents for the social history of that island. His Novelle Rusticane (1883) is the source of Mascagni's popular opera Cavalleria Rusticana; but his collections of short stories, Vila dei campi (1889) and Medda (1874), contain his finest sketches of the manners of Sicilian peasants, their savagery, humour, and passion for revenge. Many enjoy

Vergara, a cotton and linen manu-?7 m. S.W. of San

ich, as with Deva, ail), in Guipuzcoa,

Vergennes, Charles Gravier, Comto de (1717-87), a French statesman, was Ostend (1601-2). Moreover, he shared in the success of the Cadiz expedition accession of Louis XVI., 1774), by over twenty years' practice in diploder, Constanti-

Hostility to anding feature of his policy. Thus he spent more money than his country could afford in assisting the Americans in their War of Independence, and in 1777 cagerly recognised their new republic. He further gave his friendship to Austria and his support to Turkey, and at home was at daggers-drawn with Necker.

Vergil, see VIRGIL.

Vergil, Polydore, or 'De Castello' 1470-c. 1555), an Italian miscellancous writer, spent the first and last years of his life in Urbino, his birthplace; but the middle and chief portion was passed in England (1501portion was passed in England (1501-50), where he was at first employed collecting Peter's pence for Pope Alexander VI., and where he was ap-pointed archdeacon of Wells in 1508 and prehend of Orgata in St. Barrie and prebend of Oxgate in St. Paul's in 1513. The twenty-six books of his Historia Angelica in Latin (1533), which closes with the death of Henry VII., is still consulted as an original authority of value. His Proverbiorum Libellus (1493) is known by name to all readers of the Letters of Erasmus, whilst his De Rerum In-ventoribus (1499) deserves mention as

the first book of its kind.
Vergniaud, Pierre Victurnien (175393), a French orator and revolutionlist; dabbled in divinity, law, and commerce, before finally he found his true sphere of action, the National Assembly, whither he was sent in 1791. Here his impassioned yet reasoned eloquence led him to the leadership of the Girondists. The ominous speech of March 1792, in which he stooped to gloss over the excesses perpetrated at Avignon, fades away before that glorious oration of Dec. 1792, in which he urged an appeal to the people to decide the commerce, before finally he found his an appeal to the people to decide the king's fate. With twenty-one fellowking's fate. With twenty-one fellow-Girondists he fell a victim to the Reign of Terror, and 'died uncon-fessed, a philosopher and patriot.'

Veria, a tn. of Macedonia, European Turkey, about 38 m. W.S.W. of Salonika. Pop. about 7000.

Veria, or Verria, see BERGA

Verjuice, or Verges, an acid liquor, expressed from crab apples. It is added to cider to give greater roughness and tartness, and in France is fermented and sweetened to make a favourite drink in rural districts.

Verkhne-Dnieprovsk, a tn. in the gov. of Yekaterinoslav, Russia, about 34 m. W.N.W. of the town of Yekaterinoslav. Pop. about 10,000.

Verkhne-Udinsk, a tn. in Transbaikalia, Siberia, situated on the Trans-Siberian Railway. Pop. about

Verkhoyansk, a vil. on the Upper Yana R., in the gov. of Yakutsk, E.

Thus he spent more is country could afford has been observed. It is inhabited by he Americans in their lendence, and in 1777 ised their new republic.

Verlaine, Paul (1844-96), a French

poet, born at Metz. His lyrics are of the so-called impressionist type: half half mystic, intensely sensuous, beautiful in inspiration and subtle in rhythm, akin to the music Debussy, who has set some of them, e.g. the Fêles Galantes. His early paganism, responsible for such Baudelairean works as the Fêtes Galantes (1860) and Poèmes Saturniens (1866), was superseded by devout Catholicism, which came over V. during his imprisonment at Mons for shooting at the poet Rimbaud. Sagesse (1881) is on a level with the finest religious poems ever written. Other works: Romances sans Paroles, 1874; Jadis et Naguère, 1884; Amour, 1888; Bonheur, 1891, etc. Life by Le Pelletier (Eng. trans.), 1909.

Vermeer, Johannes (1632-75), a

Dutch painter, was a native of Delft, playing a leading part in the Delft Guild. Besides his celebrated 'View of Delft' (Hague Museum) he executed many attractive genre pictures and some landscapes and portraits.

Vermejo, see BERMEJO, RIO. Vermes, see WORMS.

Vermicelli, a staple food in Italy, and is so called because it consists of worm-like threads (from It. vermi-cello, a little worm), made from the granular meal of certain kinds of wheat.

Vermifuge, a medicinal agent for expelling worms. The most important is extract of male-fern. See

ANTHELMINTICS.

Vermigli, Pietro Martire (1500-62), a Protestant theologian, was a native of Florence. He joined the order of Saint Augustine in 1516, and was eventually named visitor-general. He afterwards, however, embraced the views of the Reformers; becoming, in 1542, theological professor at Strass-He then visited Cranmer in England, where he was made a pro-fessor at Oxford, but he returned to Strassburg during the Marian perse-cutions. His last post was that of professor of theology at Zürich. Some of his works are collected under the

title Loci Communes, 1583.
Vermilion, the red variety of mer-

curic sulphide, HgS. It may be obtained by subliming the black sulphide formed by triturating mercury and sulphur together in a mortar. It is also prepared by digesting the black amorphous sulphide for some hours in alkaline sulphides. used largely as a pigment, V. is but is Siberia, Russia. The average winter commonly adulterated with ferric

oxide and red lead. readily sublimes, and this constitutes

a test of its purity. Vermin, a general term for noxious animals, perhaps most commonly applied to rats and mice, but frequently used of the insect parasites

Vermland, or Karlstad, a län in the S.W. of Sweden, lying to the N. of Lake Vener and adjoining Norway. Capital, Karlstad. Pop. about

25Ŝ,000**.** Vermont, belongs to the New England group of the United States. It has an area of 9565 sq. m., and is remarkable in its group for having no seaboard. The name ('Verd Mont') has reference to the Green Mts. (highest peak, Mt. Mansfield, 4364 ft.), which traverse it from N. to S. First and foremost V. is an agricultural state, producing oats, maize, barley, hay, potatoes, and maple sugar. The quarrying of marble, granite, and slate is the most profitable industry, and after that lumbering and timbering. Metal founding, flour milling, and the manufacture of hosiery, other woollen goods, and paper are also important. The capital, Montpelier, is only the fourth city in point of size, Burlington being the largest. Pop. (1910) 355,956.

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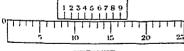
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Vernon: 1. A tn. in the dept. of
Eure, France, situated on the R. Seine.
It manufs, chemicals and has stone

quarries. Pop. (est.) about 8700.
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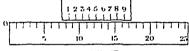
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of France, Sultan Soleyman I., and ancient Romans talking in the tombs Charles V. of Spain as associates of of the Sciplos. Christ. He revelled in gorgeous banquets, pageantry, and all the wealth of colour, apparel, and furniture that the material world can offer. Apart from the fine 'Vision of St. Helena' (National Gallery), his best paintings and frescoes are in the church of San Sebastiano and the Villa Masiera (Venice).

Veronica, or Speedwell, a genus of herbs and shrubs (order Scrophulariaceæ), a number of which are British, some common, some rare; one of the best known is brooklime (V. beccabunda) which occurs in ditches. Several species are grown in garden beds and shrubberies, and they are specially valuable on poor soil.

Veronica, St. (corruption of the Lat. ra icon, 'true image'), the name vera icon, 'true image'), the name given to the woman whom tradition speaks of as having wiped our Lord's face with a kerchief on the road to Calvary. The name was first given to the 'true image' of the holy face The name was first given which was miraculously imprinted on the kerchief, but was later igno-rantly transferred to the woman herself.

Verrall, Arthur Woollgar (1851-1912), an English classical scholar, brought a brilliant and original mind including the Fasti Pranastini, and to bear on the most beaten track of the abridgment of his work, Delearning, namely, the classics. In Verborum Significatione.

1874 he was admitted a fellow of Verrochio, Andrea del (1135-88), an Trinity College, Cambridge, and from 1877 was associated with that university as one of its most stimulating

accept the expressed in (1895), list ek know the

essays and texts. Mr. Bayfield has attached a memoir to the essays of V. he has

published (1913).

Verres, Gaius (c. 120-43 B.c.), a Roman proprætor of Sicily, notorious for his extortions and embezzlements. He first screened himself from prosecution by deserting Marius for Sulla. a more substantial protector; and secondly by betraying Dolabella, who in Cilicia was his abettor in venial practices. On his return from Sleily in 70, however, he had to stand his trial. Cicero brought such damn-ing evidence against him that Hortensius, his counsel, refused to speak, and V. sought disreputable exile in Massilia.

Verri, Alessandro, Count (1741-1816), an Italian romancer, was a younger brother of Pietro (q.r.). He fashioned his stories out of his classical learning. and his Saffo and Evostrato were much and the decoration of the Interior was read in their day. But his most supervised by Lo Brun. Louis XV. famous work was Le Notti Romane, in which he imagines the spirits of since then it has been the scene of

Verri, Pietro (1728-97), an Italian historian, served in the Austrian army, and in 1765 became a member of the Council of Economy in Milan, His chief works are: Memorie ull' Economia Pubblica dello Stato di Milano, Meditazioni sull' Economia Politica, and Storia di Milano as far as the time of Charles V.

Verrio, Antonio (c. 1639-1707). Italian painter, is described by Wal-pole as an excellent painter for the sort of subjects on which he was employed, that is, without much invention and with less taste. Charles II. made over to him £5500 during the years 1676 to 1681, when he was employed decorating the ceilings and walls of Windsor Castle, and thought fit to introduce himself and Kneller in periwies watching 'Christ healing the Sick. His decoration of the great staircase at Hampton Court is poor.

Verrius Flaccus, a Roman gram-marian of the time of Augustus, who appointed him instructor to his grandsons, Caius and Lucius. He died under Tiberius. Flaccus was the author of several grammatical works of which we still possess numerous fragments.

Verrochio, Andrea del (1435-88), an Italian artist, was 'goldsmith, master of perspective, sculptor, carver, painter, and musician' according to Vasari. The only authentic painting of his is the somewhat hard but forcible 'Baptism of Christ,' now in Florence, but it is of interest to note that both Lorenzo di Credi and the great Leonardo worked in his studio. As a sculptor his renown has a sure foundation in the magnificent equestrian statue in bronze of Bartolommeo Colleoni, which now adorns a piazza of Venice. This was cast from Verrochio's model by Leopardi and unveiled in 1496.

Versailles, a tn. in France, about 10 m. S.W. of Paris. Its inhabitants number some 45,000, and the place is chiefly notable on account of its palace. This consisted originally of a mere château, erected by Louis XIII.; but in 1670 Louis XIV. con-ceived the idea of augmenting the building, and he commissioned the architect Le Van to proceed accor-dingly. This architect was succeeded anon by Mansart, who in turn was followed by De Cotte; while the gordens were designed by Le Notre,

many historic events. Here, in 1783, (d) Marmion; whilst Keats and Words-Britain came to terms with her Amer- worth are two of a host of sonneteers Britain came to terms with her American colonies; while it was here again in 1871 that the capitulation of Paris was signed. Prior to this V. had been turned into a public museum, and it contains a great array of pictures done in Napoleon's time; notably some by Louis David, and others by Isabey. Vernet, and Gros. See Nolhard, La Création de Versailles, 1901 1901.

Verse, a concourse of words so arranged as to give a metrical or rhythmical effect. V. is figuratively derived from the turning of the plough (from rerière, to turn), which produces a line or furrow. A V. is strictly 'a series of rhythmical sylin script to occupy a single line.' In English the word 'V.' is loosely used English the word 'V' is loosely used of metrical composition as opposed to prose; and the singular V., as well as the more correct Vs., is used of a collection of several lines of poetry. The Greeks and Romans made their versification depend on the way in reptiles, and birds. Vs. are characterised one another, that is, on quantity—whereas in modern languages or wall of the threat. rhythm is dependent on stress or wall of the throat. accent. Definite combinations of syllables are called 'feet.' It is a convention in English prosody to use the classical names for the various feet, this being made possible by the assumption that an accented syllable is equivalent to a long syllable, and unaccented to a short one. The following quotations exemplify the bestlmown feet :-

(1) spondee - and dactyl - -

(a) 'Ārmā vi | rūmquē cā | nō ; Trō | jāe qūi | primūs āb | ōvīs ' N.B.— marks the 'caesura' or pause.

(b) English dactyls:

'Bird of the | wilderness | '

(2) iamb and trochee.

(iambic)

(b) 'In the | middle, | leaps a | fountain | (trochaic)

(3) anapaest ~ As they roar | on the shore ' |

(4) amphibrach - -Flow gently | sweet Afton. |

The most common English V. forms are: (a) blank or unrhymed (b) heroic couplet (rhymed); (c) the Spenserian stanza of nine lines closing with an Alexandrine; (d) octosyllabic. V.; and (c) the sonnet of fourteen lines, which Surrey introduced from Italy. An illustration of (a) is Handa; of (b) The Prologue to the Canterbury Tales; of (c) the Faerie Queen; of

worth are two of a host of sonneteers (e). Icelandic Anglo-Saxon and poetry relied on alliteration, section, and stress, for its rhythm.

Versecz, a tn. in the co. of Temes, Hungary, about 43 m. S. of Temesvar, having Roman remains. The chief products are wine and brandy. Pop.

about 25,000.

Verst, a Russian linear measure equivalent to 1166; English yards.
Verstegan, Richard (d. c. 1635), an

English author and printer, was the son of a cooper of Dutch origin, and at Oxford became learned in Anglo-Saxon. Copper-plate engravings, illustrating the execution of the Catholic martyrs and taken from the author's lables, divided by pauses and destined own designs, give a curious interest to his Theatrum Crudelitatum Horeticorum, 1585?

Vertigo, or giddiness, a sense of lack of equilibrium. It may be aural, connected with ear disturbances; or ocular, connected with eye disturb-ances; or cerebral, caused by disease or injury in the brain; or gastric, caused by digestive disturbances; or may be due to the introduction of toxic substances, such as alcohol, tobacco, etc., into the blood. The chief form of aural V. is that associated with Méniere's disease, which usually involves hæmorrhage into the staggering. Ocular V. may be caused by squint, or such experiences as looking from a height, observing rapidly-moving objects, etc. Bodily disease of a generally debilitating tendency is always lightly to making (a) 'The la- | dy of | Shalott | '- tendency is always liable to produce V., and the treatment should depend upon the causative influence.

verton, a tn. in the dept. of Loire-Inférieure, France, about 4† m. S.E. of Nantes. Pop. (est.) about 5590.
Vertot, René Aubert (1655-1735), a French historian, born in Normandy. He was at first a member of the Capuchin order, then of the Premonstratenses. He gave up the religious life, however, and afterwards ligious life, however, and afterwards became a secular priest. His chief works are: Histoire des Révolutions de Portugal, 1659: Histoire des Révolutions arrivées dans la govrernement de la République Romaine, 1719.

Vertue, George (1684-1756), an engraver and antiquary, born in London. He was a pupil of Michael van der Gucht, and afterwards was commissioned by Sir Godfrey Kneller to (est.) about 10,000.
engrave many portraits. He also devoted his time to antiquarian research, pasianus, Roman emperor (70-79 and was a member of the Society of A.D.), born in Reate in the land of the Antiquaries. The notes collected by Sabini, his father being a humble tax him were used afterwards by wellope in his Ancedoles of smill says of smill says on the says of the says o Walpole in his Anecdoles of

Verus, Lucius Aurelius, joint-Verus, Lucius Aurelius, joint-emperor of Rome with Marcus Aure-lius, his brother by adoption, from 161 to 169 A.D., seems to have emu-lated Nero in his debaucheries and sumptuous living. Despatched to prosecute the wars with Parthia (162) and against the Marcomanni, he left the work of conquest to his: lieutenants, preferring the satisfaction of his own vicious tastes to the hardships of war.

Verviers, a tn. in the prov. of Liège, Belgium, about 14 m. E. of Liège and one of the chief centres of the woollen

industry. Pop. about 49,000.

Vervius, a tn. and the cap. of an arron. in the dept. of Alsne, France, about 22 m. N.E. of Laon. Pop. (est.) about 3000. Pop.

(1514-64).Vesalius, Andreas Flemish anatomist, was the son of Emperor Maximilian's apothecary: and himself became in 1514 chief physician to Emperor Charles V., and later of Philip II. of Spain. Louvain and Paris were the scenes of his studies, whilst he was afterwards professor of anatomy at Pavia, Bologna (1543), and Pisa. Discovery after discovery followed his careful dissections of human bodies; and whilst his progress disgusted Fallopius and the whole pedantic tribe of contemporary anatomists, it enabled him the more freely to expose the deficiencles of Galen, their oracle. De Corporis Humani Fabrica Libri Septem (1543) is his magnum opus. Vesicant, see BLISTER.

Vesicaria, a genus of cruciferous annuals and perennials with yellow flowers followed by bladder-like seed pods.

Vesinet, Le, a tn. in the dept. of Seine-et-Olse, France, about 2 m. E.S.E. of St. Germain. Pop. (est.)

Walpole in his Anecdotes of in England.

Verulam, a tn. of Victoria co., Icatus legionis in Britain, he reduced the sugar cane. Pop. about 1000.

Verulam, Lord, see Bacon, Francis.

Verulamium, or Verolamium, was a British city of importance in the days of the Roman occupation. It (69). Vitellius, his rival for imperial was situated, as remnants of its flint rubble walls indicate, in the near primus; and, largely owing to the support of Mucianus, V. was soon site being now Old Verulam.

Verus. Lucius Aurelius, iointis military genius; and successful termination, the work of Cerealis, to the war with the Batavi (70); the reduction of N. Wales by Agricola (78), and the conversion of the kingdom of Commagene into a Roman province, are conspicuous in the foreign history of this reign; whilst at home may be noted the expulsion

> the execution of Julius Sabinus and his wife (79), the rebuilding of Rome and the maintenance of peace and order. In V.'s own character it is his simplicity and contempt for outward shows, his common sense, and his private avarice coupled with a public bounty, which impress. Of his two sons, Titus and Domitian, both of whom succeeded him, the former

> of the philosophers and the execution of Helvidius Priscus the Stoic (73),

> alone inherited the father's virtues. Vespers, the evening service in the Latin Breviaries. It has always five

psalms. Sec Breviary.

Vespers, the Sicilian, the name give to the famous insurrection which took place at Palerino on Mar. 31, 1282, and which ended in the massacre of all the French (under Charles of Anjou) in the island, and the declaration of independence. The prime instigator of the revolution was Glovanni da of the revolution was Glovanni da Procida (q.r.), who had been prepar-ing it for twelve years, but was not actually in Sicily when it took place. He was aided by Queen Constance of Altavilla, Peter 111, of Aragon, and many other Ghibellines exided from Sicily by Charles. One of the greatest events in the history of the time, its romantic story has inspired a tragedy by Delavigne (1817), and an opera by Verdi (1853).

Vespucci, Amerigo (1451-1512), a navigator, was a native of Florence. He began his career at Seville as a merchant; but his interest in Columabout 5000.

Vesoul, a tn. in the dept. of Haute-Saone, France, situated near the R. World in 1499. He is the discoverer

of All Saints' Bay, Brazil, and has of the gov. of Upsala. Cgiven his name to the New World Vesteras. Area 2020 sq. m. in spite of the success of Columbus, 155,925.

his predecessor.

Vesta, was the Roman goddess of the hearth, and thus corresponded exactly with the Greek goddess 'Hestia.' From Lavinium, whither Eneas had brought, from Troy, the sacred fire of V. as well as the Penates, her worship was introduced to Rome by Numa; and it was he also who erected her central place of worship, namely a small round temple with a vaulted roof, in the Forum between the Palatine and Capitoline hills. In this shrine her fires were kept burning by the Vestals, her virgin priestesses (q.v.). At the 'Vestalia,' which was celebrated on June 9, until the very twilight of paganism (382 A.D.), matrons walked barefooted to her temple, carrying homely dishes for eacrifice.

Vesta, a minor planet discovered in 1807 by Olbers of Bremen, was the fourth in order of discovery, and is the brightest, being the only one visible to the naked eye, and as bright

miles.

Vestals, The, or Virgines Vestales, were the six priestesses of Vesta (q.v.), who maintained the ritual and worship of that goddess in her temple at
Rome. They were chosen by lot from
a list of twenty maidens of free and
such parts of the church have genera list of twenty maidens of free and such parts of the church have generworthy parentage, selected by the ally been used for holding meetings of pontifex. Their term of service was at least thirty years—the years of such meetings, duly convened, have learning and initiation, ten years of also acquired the name of Vs. It is actual ministration, and ten years for the duty of Vs. to provide funds for imparting their lore to neophytes, the maintenance of the edifice of the The violation of a V-'s vow of chastity church, and the due administration was punishable by death, whilst a of public worship, and to elect church-harsh retribution speedily followed if wardens. In certain parishes, other any virgin were so careless as to let the sacred fires go out.

Verteers a trained the cap, of the law and by a succession of Acts.

Vesteras, a tn. and the cap. of the län of Vestmanland, Sweden, about 55 m. W.N.W. of Stockholm on Lake län of Vestmanland, Sweden, about Vesuvianite, see Idocrass.

55 m. W.N.W. of Stockholm on Lake Vesuvian, a volcano, 7½ m. E.S.E. Mälar. It is an old town, with a cathe- of Naples, rising just now (1913) for dral and an episcopal library. Pop. about 14,000.

Vesterbotten, a lan of Sweden, exthe E. to Norway on the W. 161,372.

Vesternorrland, a län of Sweden, having on its E. the Gulf of Bothnia. The capital is Hernösand. Area, 9810 sq. m. Pop. 250,517.

Vestervik, a scaport in the län of

Kalmar, Sweden, about 75 m. N. of

Capital. Pop.

Vestments, Sacred, have been worn by the priesthood from time im-memorial. The regulations with regard to those of the Jewish priests were extremely minute, but in spite of apparent resemblances no connection can be traced between these and the Christian vestments. These last are no more than the ordinary dress of ancient times, which was retained by the clergy long after it had fallen out of ordinary use. The Mass vest-ments for a priest in the Western Church are: amice, alb, girdle, stole, maniple, chasuble. At other solemn services and in processions a cope is used. At choir offices and other occasions the clergy wear a surplice, sometimes in the English Church with the addition of a scarf and university hood. A stole is worn in the administration of the sacraments. The garments in the Greek Church differ somewhat from these. See articles on each vestment named.

Vestris, Lucia Elizabeth (née Barto-lozzi) (1797-1856), an English actress, married A. Vestris, an actor, 1813. as a 6th magnitude star. It has the lozzi) (1797-1856), an English actress, greatest albedo, and a diameter of married A. Vestris, an actor, 1813. 250 m. (Bamond), 214 m. (Farley). Sang in Italian opera in London and Revolution is performed in 3'63 years. Made a great success as Tilla at a mean distance of 219 million in The Siege of Belgrade, 1820, and acquired a considerable fortune. Appeared chiefly in ligh topera and

pantomime.

law and by a succession of Acts.

a height somewhat over 4000 ft. from the eastern shores of the Bay of Naples, Italy. Monte Somma, the Mons Summanus of the ancients, is a great semicircular girdle of cliff to N. and E., parted from the cruptive cone by the valley known as Atrio di Cavallo, and itself the remnant of a massive wall which once shut in the huge cone of prehistoric times. Lava, scoriæ, ashes, and pumice-stone are the fabric of the mountain, which Kalmar, situated on the Baltic Sea. during activity emits a large assort-Pop. 9970. ment of minerals, such as augite, Vestmanland, a gov. of Sweden, W. magnetic fron, leucite, hornblende during activity emits a large assortment of minerals, such as augite,

and mica. The amazing fertility of each have colleges. its slopes, on which especially those tries the professions explains why for over twenty-five centuries V., in spite of its constant menace, has been the heart of a densely populated region. The historic records of the eruptions have induced geologists to treat Y. as the great object lesson on volcanoes, and in 1844, at the expense of the Neapolitan government, an observatory was established, to which the researches of Melloni, Palmieri, and Mattucci have given a European fame. The destruc-tion of the noble cities of Pompeil, Herculaneum, and Stabie, the tracic death of the elder Pliny, and the graphic description of the disaster by Constantinople, and during the eruption of 512 some actually reached Tripoli. Other years of remarkable activity were 1794, 1822, 1855, 1871. and 1906.

Veszprim, cap. of Veszprim co., Hungary, on the Séd, 69 m. S.W. of Budapest; has coal mines, iron works, and cattle markets. It has a castle, episcopal palace, and Gothic cathedral (16th century).

14,000. Vetch, or Tare (Vicia saliva), a leguminous annual plant, with trailing or climbing stems, compound pinnate leaves, and reddish-purple thowers. In agriculture two races, winter V. and spring V., are known. The former is hardy and is sown in autumn to produce spring fodder. Spring Vs., which are more delicate and make more rapid and luxuriant and make more rapid and inviriant growth, are sown from February on-wards, and are cut for hay when in bloom. Numerous other species of the genus including the beautiful tufted V. (F. cracca) are common British

Veterinary Science began in the Egyptian civilisation, and from the Egyptian's knowledge of the horse and its diseases the Greeks and the and its diseases the Greeks and the Romans learnt much. The Roman Vegetius (c. 300 A.D.) left writings on the subject, which in the 16th and 17th centuries were much studied

vhere the first established at the second at

Alfort, near Paris, in 1766. A Frenchman, St. Bel, founded the Royal with the Balife Sca and Lake Vener Veterinary College in London in 1790, and it was another Frenchman, Liautard, who first established a wide. Its college in New York, Liverpool, Edinburgh, Glasgow, and Dublin now most beat

In most countries the professional status of the states on which especially those grapes luxuriate, from which the wine 'Lachrime Christi' is made, protected by law. In liritain the explains why for over twenty-five centuries V., in spite of its constant Veterinary Surgeons conducts professional examinations and grants degrees (M.R.C.V.S. and F.R.C.V.S.). Until 1881 the Highland and Agri-cultural Society granted veterinary certificates in Scotland, and holders of these were brought under the R.C.V.S. in 1900. With the increased attention to the eradication of disease from domesticated animals and the protection of public health. the services of the veterinary surgeon are in growing demand. All state departments of agriculture have their veterinary branches. In the British graphic description of the disaster by reterinary branches. In the british his nephew, an eye witness, have cast army regimental veterinary surgeons an unfading glamour over the eruphare incorporated in the Army Veterition of '79. During those of 472 and mary Corps, which has a school at 1631 particles of dust alighted in Aldershot. A veterinary executive Constantinople, and during the officer is attached to each cavalry eruption of 512 some actually reached regiment and mounted corps, and a regiment and mounted corps, and a cavalry regiment has twenty-two farriers and shocing smiths. See Fleming's Veterinary Obstetries, Thompson's Veterinary Lectures, and Courtenay's Veterinary Medicine.

Veto, a term applied to the right of a king or other chief magistrate or officer to withhold his assent to the enactment of a law, or, generally, of one branch of the executive of a state to reject the bills, resolutions, or measures of other branches. The term originates in the power of the tribunes of the plebs of ancient Rome to declare their protest against any unlawful measure, which they did by pronouncing the word 'veto' (for-bid). In Great Britain the power theoretically belongs to the crown (see CROWN). In the crown colonies the governor exercises the power (see Colonial Governor). In the U.S.A. the president can yet a measure of Congress; but notwithstanding his veto, the measure becomes law if subsequently carried by a two-third-majority of each house. In Scots church history, the Veto Act was the name of an Act passed in 1835 by the General Assembly of the church, by which it was decreed that no one should be admitted a minister of any vacant church if a majority of the male heads of families should dissent. The decision of the Court of Session and the House of Lords that the Act was ultra vires led ultimately to the disruption of 1813.

also dotted with islands, one of the chlet being Visingsö.

Veuillot, Louis (1813-83), a French journalist, born at Boynes (Loiret). He was entirely self-educated. He clited the Echo de Rouen (1831), the Charte de 1830 (1837), and La Paix. He returned to Paris from Rome (1838) a violent supporter of Ultramontanism, and as editor of the heartiful 19th century above the proving montanism, and as editor of the Univers upheld the claims of the Church. In 1842 he became secretary to the Minister of the Interior. He published Melanges Religieux. Historioues. Politiques, et Littéraires, 1857-76.

Vevey, a tourist resort in the canton of Vaud, Switzerland, situated about 11 m. E.S.E. of Lausanne on Lake Geneva. One of the chief buildings of interest is the church of St. Martin, in which is Ludlow's tomb. This town is also the scene of Rousseau's Nouvelle Héloise. The chief manufs, are chocolate, watches, and infants' food. Pop. 13,596.

Vexatious Indictments Acts. The object of these Acts is to prevent un-warrantable prosecutions. Prior to the Act of 1859; private persons had an unlimited right to prefer an indictment to a grand jury without any previous inquiry into the truth of the accusation before justices in the police court. The above Act provides that no indictment can be preferred that no indictment can be preferred to for certain specified misdemeanours (see Criminal Law), viz. perjury; substraition of perjury; conspiracy; false pretences; keeping a gambling or disorderly house; indecent assault; misdemeanours under the Debtors Act, 1869; libel and other offences under the Newspaper Libel and Registration Act, 1881; misdemeanours under the Criminal Law Amendment Act, 1885; and indictable offences under the Merchandise Marks offences under the Merchandise Marks (0.x.) Act, 1887, unless (a) the prosethe Act of 1859 private persons had onences under the Merchandise Marks monument of the poet Shelley, (q.t.) Act, 1887, unless (a) the prosecutor has been bound by recognisance 22,000.

to prosecute or give evidence against the accused; or (b) the accused has journey '), the last communion adbeen committed to or detained in cus-ministered to a dying person. It is tody or bound by recognisance to then given daily when death is appear; or (c) unless the indictment imminent. has been preferred by the direction or with the consent in writing of a high unless he secures a conviction.

Himinologii.

beautiful 12th century abbey church

of St. Madeleine.

Vezin, Hermann (1829-1910), an actor, came from the United States to London in 1850, and soon became one of the leading Shakespearean actors in the metropolis, playing Hamlet, Shylock, Othello, and other classic rôles. In later days he acted less, but taught elocution. He was himself an excellent elocutionist.

Viadana, Lodovico, or Lodovico Grossi (c. 1565-1645), an Italian com-poser, was a native of Viadana. After entering a religious order he held the post of choirmaster at Fano. Venice. and Mantua. He is usually considered to be the inventor of the basso con-tinuo. See Life by A. Parazzi.

Viaduct, see BRIDGE.

Viatka, sec Vyatka. Viau (or Vaud), Théohpile de (1590court judge or a law officer of the 1626), a French poet, born at Clairac, crown; or (d) in the case of an in- In 1616 he went to Paris and was atdictment for perjury, the prosecution tached to the household of the Duc detenent for perjury, the prosecution tached to the household of the Duc is by direction of a court, judge, or de Montmorency. The publication public functionary authorised by (1619) of his Cabinet Salirique, with statute to direct such a prosecution. its strong Huguenot sentiments, By the Vexatious Indictments Act, forced him to leave Paris. He pre-1867, if the prosecutor chooses to be tended to become a convert to Roman bound over to prosecute, a course Catholicism, but the publication of open to him if justices refuse to come his Parnasse Salirique (1623) led to write he was the condemned in costs his arrest and condemnet in to det the mit, he may be condemned in costs his arrest and condemnation to death, less he secures a conviction. a sentence afterwards changed to Vexilla Regis, see HYMNS—Latin banishment. He also published Pyrame d Thisbé, a tragedy (1623),

and Histoire Comique (1621). Œuvres Complètes (2 vols.) appeared these courts.

Vicar and Vicarage.

Viaud, Louis Marie Julien, sec Loui, PIERRE.

Vibert, Jehan Georges (1840-1903). a French genre painter, born in Paris and educated at the Ecole des Beaux Arts under Barrias and Picot. Among his paintings are: 'L'Appel après le Pillage ; 'Un Couvent sans less Armes '; 'Portrait de Coquelin Ainé '; 'Le Récit du Missionaire '; 'L'Ante-Chambre de Monseigneur '; 'Bailli Chambre de Monseigneur '; 'Bailli Chambre de Monseigneur '; 'Bailli Chambre de Monseigneur; Bailin de Suffren' for the Ministry of Marine; the 'Annonciation'; and 'Mater Dolorosa' for the Palais de Justice. He also wrote the dramas: Tribune Mécanique; Les Chapeaux; Les Portraits; and Le Verglas.

Viborg: I. A gov. and its cap. in S.E. Finland. The government is in part plateau, and there are many lakes, including Lake Saima, which now communicates with the sea by Saima communicates with the sea by Salma Canal. There are granite quarries and iron works, but the soil is poor. Area 13,530 sq. m. Pop. 422,000. The town, which lies at the head of Viborg Bay, in the Gulf of Finland, is the seaport for Karelia and E. Savolaks, and exports timber, iron, paper, butter, etc. The historic castle, erected in 1293, is one of many anti-There are machine shops and sawmills, besides foundries, but V. is better known as a tourist resort, v. is netter known as a tourist resort, the environments being most picturesque. Pop. 48,730. 2. An industrial and ancient city of Denmark, lies on Viborg Lake, 24 m. W. of Randers, in Jutland. Pop. 10,885.

Vibrio, a generic term for certain bacteria of spiral form.

Viburnum, a genus of deciduous and evergreen shrubs and trees (order to be confined to the V. of India. The Caprifoliaccee). V. opulus, the guel-king's representative in Iroland, for der rose, is an ornamental British instance, is styled the lord-lieutenant; shrub, with large white flower heads in the Australian Commonwealth, the followed by pinkish berries which are governor-general, eaten in parts of Europe. A variety Vich (Roman Ausa), a tn. of Bareaten in parts of Europe. A variety Vich (Roman Ausa), a tn. of Barof this is the snowball tree, a favour-celona prov., Spain, 38 m. N. of Barite garden shrub. V. tinus i Lauristinus.

Vice-Admiralty Courts. colonial courts exercising nearl

colonial courts exercising near same jurisdiction as the High of Admiralty in England; but they a tn. of the dept. of Amer. France, are not courts of record (see Recond). Such courts are established by the It is a famous watering-place and its Admiralty by commission under the springs were known to the Romans. Great Seal, and may be abolished in Pop. 15,300.

The invisidiction of Vicia, see VITCH.

India or Vicia, see VITCH.

India or Viciou having a MISSION.

extends Vickerstown, N. and S., a tn., Wal-prize, the ney Island, Lancashire and the home the navy, of the employees of Vickers Maxim ordnance factories. Pop. about 4000.

Vicksburg, the co. seat of Warren co., Mississippi, U.S.A. It is an im-

His the Privy Council from decisions of A vicar is one

who holds a benefice as deputy of the rector, who may be a layman. The rector, therefore, receives a share of the emoluments of the incumbency. The position occupied by the vicar is sometimes called a vicarage, but this term is more frequently applied to

the vicar's residence. Vice-Consul, one who acts in the Vice-consular place of a consul. officers of the British Foreign Officers are appointed in some cases by commission from the crown, in other cases by letter of authority of a superior

consular officer.

Vicente, Gil, see GIL VICENTE. Vicenza, a tn., the cap. of Vicenza prov., V

of the T 41 m. N. ..

41 m. N. ... factures silk and woollen goods, leather, pottery, and musical instruments. Many of the fine buildings were designed by Palladio (d. 1580), a native of V. The Gothic cathedral dates from the 13th century. Pop. 45,000. The district of Sette Communi in the N. of the prov. consists of Asiago, Euego, Foza, Gallio, Lusiana. Roana, and Rotzo, whose in-Lusiana, Roana, and Rotzo, whose inhabitants speak a German patois.

Vice-President, the next in rank to a president. As a rule the duties of a V, are necessarily nominal or dor-mant. In the U.S.A. the V, is he who automatically becomes president on the demise of the president during the

latter's term of oilice.

Viceroy, one who rules over a kingdom or country in the name of the king with regal authority. The title so far as England is concerned seems

al (1803) za (1010).

and has also railroad shops and Pop. (1910)machinery works.

20,814.

Vico, Giovanni Battista (1668-1744), an Italian philosopher, historian, and jurist, born at Naples, where he became professor of rhetoric in the uni-In 1734 he was appointed versity. historiographer to Charles III., King His chief work is Prinof Naples. cini della Scienza Nuova d'Intorno alla Commune Natura delle Nazioni (1725) of which Michelet published a French translation, Principes de la Philosophic d'Histoire (1827). See Flint, Vico, 1885, and R. G. Collingwood's translation, The Philosophy of Giovanni Battista (revised by Profes-

Sor Benedetto Croce), 1913.

Vice Equense, a tn. in the prov. of and 15 m. S.E. of the city of Naples, on the Bay of Naples. Pop. (est.)

11,000.

Victor, a city of Teller co., Colorado, U.S.A., 4 m. S.E. of Cripple Creek by rail, the centre of a mining district.

raii, the centre of a mining district.
It was settled in 1894 and destroyed
by fire in 1899. Pop. (1910) 3162.
Victor, Claude Perrin, Duke of Belluno (1764-1841), a French marshal,
born at La Marche (Vosges). He entered the army in 1782, distinguished
himself at Toulon (1793), and became a brigadier-general. He commanded in the Italian campaigns of 1796-97 and 1799-80, and won distinction at Marengo. He was captured by the Prussians (1807) and exchanged for Blücher. At Friedland he won the baton of a marshal, and in 1808 was created Duc de Belluno. He took part in the campaigns in Russia, Ger-

Victor, Sextus Aurelius (fl. 370 A.D.), a Roman historian, was city prefect under Theodosius and possibly consul with Valentinian in 370 A.D. His life and his claim to the authorship of the! following treatises are alike obscure. These are Origo Gentis Romana, De Viris Illustribus Urbis Roma: De Casaribus: and De Vita et Moribus Imperatorum Romanorum, which were first published together in 1579.

Victor Amadeus, see Savor.
Victor Emmanuel I. (1759-1824),
King of Sardinia (1802-21), born at
Turin. He commanded the Sardinian forces against the French (1792of the continental of the continent of the continent of the continent, savoy, and Nice, and the of Syria, she was rammed by the second (1815) restored Genoa. He Camperdown, and sank in a few

portant cotton manufacturing centre abdicated in favour of his brother, Charles Albert, in 1821.

Victor Emmanuel II.

(1820-78).Victor Emmanuel 11. (1020-10), King of Sardinia (1849-61) and of Italy (1861-78). He ascended the throne on his father's abdication after the defeat at Novara (March 23, Aided bу ministers. his D'Azeglio and Cavour, and later by Garibaldi, Victor Emmanuel II. had created a new Italian kingdom by the end of 1860, and was proclaimed King of Italy (Feb. 26, 1861). In 1866 he wrested Venetia from Austria, and in 1870 occupied Rome. See ITALY. See also Lives by Godkin (1879) and Dicey. Victor Emmanuel III. (b. 1869), King of Italy, the only son of King Humbert I. He ascended the throne

on the assassination of his father (July 29, 1900). He entered the army (1887); became lieutenant-general (1894) and commanding general at Naples (1897). He represented his father at the Russian court (1896), at the Victorian Jubilee (1897), and at Berlin (1900). In 1896 he married Princess Elena of Montenegro. As a result of the war with Turkey (1911-12) he added Tripoli to the Italian

domains.

Victoria: 1. The cap. of British Columbia, has a fine situation, with a harbour only admitting vessels of 18 ft. draught, on the S.E. margin of Vancouver Is. It is a well-built, pleasant city with a cathedral, a high school affiliated to M'Gill University in Montreal, a public library, a hand-some park on Beacon Hill, and some park on Beacon electric lighting and tramways. Esquimalt, the headquarters of the British Pacific squadron is 3 m. to the many, and France. He went over to the Bourbons, and was on the commission appointed to try those officers who deserted to Napoleon during the 1900. Pop. (1911) 31,660. 2. a tn. on of War (1821-23) and served in Spain Southern Rhodesia. 3. A seaport (1823). shipping coffee, rice, sugar, and manioc, 290 m. N.E. of Rio de Janeiro, in Espirito Santo, Brazil. Pop. about 11,500. 4. A tn. with a commerce in cereals and sugar, 40 m. W.S.W. of Caracas in Venezuela. Pop. about 8500. 5. A vil., 118 m. S.E. of Concepcion by rail in the prov. of Malleco, Chile. Pop. 8000. 6. The chief city and port, manufacturing cotton, sugar, and vermilion in the British island of Hong Kong. Pop. (Chinese in 1911) 219,386. 7. The (Chinese in 1911) already cap. of Labuan Is., a British possession off the S.W. of British N. Borneo, Malay Archivelago. Pop. about 2000.

minutes with the admiral, Sir George the direction of the Indian Mutlay Tryon, and 358 of her crew (June 22, by the government did not always 1893).

Victoria (1819-1901), Queen of Great Britain and Ireland, Empress of India. Daughter of the Duke of Kent, a son of George III., she suc-ceeded her uncle William IV. in 1837. Her succession to the throne separated the thrones of Hanover and Great Britain which had been held by British sovereigns since the accession of George I. Her reign opened somewhat inauspiciously. Canada was in but by 1839 Canada was revolt, but by 1839 Canada was united and granted a constitution. But at home more troubles prevailed. the Chartists were at the height of their power and small riots were breaking out in many parts of the country. Melbourne, her first Prime Minister, was compelled to resign in 1839, but the bed-chamber question prevented the constitutional succession of Sir Robert Peel. In 1841 Peel, however, became Prime Minister, and many important measures were passed. In the meantime (1840) the queen had married her cousin, Prince Albert of Saxe-Coburg. The ministry of Peel (1841-46) witnessed many stirring episodes and events. War broke out in Afghanistan and with the Sikhs, the latter war ultimately resulting in the annexa-tion of the Punjab in 1849. The Tractarian movement, which had made a great stir in religious circles, culminated in 1845 in the secession of Newman to Rome. In the same of Newman to Rome. year the importance of some revision of the Corn Laws became obvious. Peel, the head of the Protectionist party, had his hand practically forced by the potato famine in Ireland, and in 1846, after having resigned and been compelled to resume office, repealed the Corn Laws, and in so doing smashed the Tory party, who went into the wilderness to be educated by the future leader, Dis-racli. The next ten to fifteen years were occupied chiefly with foreign affairs, which were directed chiefly by Palmerston. His policy and his in-dependence did not appeal either to the queen or to the Prince Consort. The royal policy was reflected in the exhibition which was held in 1851, the Palmerstonian policy in the glee with which he hailed the revolutions of 1848. In 1851 Palmerston was of 1848. forced to resign, since he had sent to office and concluded the w following year. Still, relation the queen were not of the best, and then's point, may be called Imperial-

fall in with the wishes of the queen. Conspiracy Bill, a paipable The attempt to conciliate Louis Philippe, led to the downfall of Palmerston. but even yet the Tory party were not strong enough to hold the reins of government. In 1859 Palmerston was again in power in spite of Lord Derby's attempt to hold the Con-servatives in office. In 1861 the Civil War in America broke out, and caused a great famine in Lancashire. Public sympathy was, on the whole, on the side of the South, and the escape of the Alabama was received general rejoicings, although with later it cost this country a very considerable sum (£3,250,000). next decade witnessed a great change in the political life of the country. In the political life of the country. To a very great extent the deaths of the Prince Consort (1861) and of Lord Palmerston (1865) mark a distinct division in the reign of the queen. The accession to power of Disraeli in 1868, and of Gladstone in the same year, changed the politics of England. Between 1832-68, the Whigs had been almost continually in power, relying for support upon the middle classes who had been enfranchised by the Reform Act of 1832. The accession to power of Disraell marks the beginning of Conservative power, i.e., a Tory party who realised the conservative tendencies of the lower middle classes, sought to enfranchise them, and were prepared to move them, and were prepared to more with the times; the accession to power of Gladstone marks the beginning of a Liberal party who were more progressive and, for want of a better word, more radical than their Whig forebears. Disrueli succeeded to power in 1868, but the time of the Conservatives had not yet come; he was defeated on the question of the disestablishment of the Church in disestablishment of the Church in Ireland, and Gladstone succeded. He was in power between the years 1868-74. During that period many sweeping measures were introduced and passed; the Irish Church was disestablished, an Irish Land Act, an Elementary Education Act, a Ballot Act, and a Judicature Act were passed, and purchase was about the following the product of t lished in the army. All these measures, although good, were startling. and in the sight of many old Tories almost revolutionary. The queen did not view them all with pleasure, and, despatches congratulating Louis not view them all with picasure, and philippe on the coup d'étal without having the sanction of his sovereign. them. In 1874, however, the dissolution was succeeded by a Conservative and in 1855 Palmerston was and Dismell became for exally a Prime Minister. The keynote of Dis-

' lingoism.' In 1875 he bought up the greater number of the Suez Canal shares, which proved of overwhelming importance in the pursuance of our Egyptian policy at a later date. In 1876 the queen adopted the title of Empress of India, India having become a crown colony after the suppression of the Mutiny. The policy of Disraeli (or Beaconsfield as he then was, having accepted an earldom in 1876) in the Near East was bitterly attacked by Gladstone, but the Con-gress of Berlin, followed by the Treaty of Berlin in 1878, was supported by of Greater part of the inhabitants of Great Britain. In 1879 the Zulu War was brought to a successful close, and in the same year the celebrated Midlothian campaign brought to an end the Conservative government. The Liberals were returned to power with a large majority, and Gladstone became premier for the second time. In 1881 the Boer War and the defeat of Colley at Majuba was followed by the granting of in-dependence to the Boers. British supremacy in Egypt was established by the battle of Tel-el-Kebir (1882). but the attempt to evacuate the Sudan was not so fortunate, and Gordon was killed at Khartoum before the relieving party could reach him. The affair created much feeling in the country at the time, but there seems little doubt now but that Gordon reversed the policy of evacuation when he landed in Egypt. Ire-land had been a source of constant trouble, and the Irish Land League was persistent in its demands for Home Rule. The disorder culminated in the Phoenix Park murders in 1882. This was followed by a Crimes Act which for a time restored order. In 1885 Salisbury formed a ministry 1885 Salisbury formed a ministry Victoria Cave, situated 12 m. N.E. which, however, only lasted six of Settle in Yorkshire, 900 ft. above months, at the end of which Glad-the Ribble, and 1450 ft. above the stone again returned to power. He sea. Romano-Celtic antiquities, innad determined that the policy of cluding coins, pottery, and bronze coercion must cease in Ireland, and ornaments and implements, were distinteduced a Home Rule Bill which covered in the uppermost layer, and split the Liberal party, who were in a lower the bones of the elephant. defeated. Salisbury's second administing hymna, rhinoceros, and bear. It was tration was formed in July 1886, and lasted until 1892. In 1887 the queen celebrated her Jubilee. Attempts the later of the late

ism, called by his political opponents succeeded by Rosebery, who was defeated in 1895 on the 'cordite vote,' and the Conservatives and 'cordite Unionists as a coalition returned to power. Salisbury became premier for the third time. This ministry witnessed the Jameson raid (1896). the advance into the Sudan and the quarrel with the French in the matter of Fashoda which nearly led to war. In 1899 the trouble with the Boers in South Africa, which had been acute since 1896, resulted in the outbreak of the South African War. In 1900 the Australian Commonwealth Bill was passed, and the Boxer massacres led to international interwention in China. In the January of the next year Queen Victoria died. She had celebrated her Diamond Jubilee in 1897, and had reigned for a longer period than any previous sovereign. She had shown herself, on the whole, a constitutional monarch, but one with a keen insight into her own prerogative. Throughout the own prerogative. empire she was known and loved, and in the latter years of her reign was a most popular sovereign. See Biogranhical Dictionary: Lee. Life of Queen Victoria, 1904.

Victoria, Eugenie Julia Ena (b. 1887). the only daughter of the late Prince Henry Maurice of Battenberg and the Princess Beatrice. In 1906 she married King Alphonso XIII. of Spain, and has two sons and two daughters, the Prince of the Asturias being born in

1907.

Victoria, Lake, or Zor-kul, or Sarykul, lies at an altitude of 13,400 ft. on the Great Pamir, in Ferghana, Russian Turkestan, Central Asia. It is a vestige, gradually diminishing in size, of a prehistoric period of glaciation, and is probably not the true source of the Oxus.

celebrated her Jubilee. Attempts which can be conferred on officers or were made to promote order in Ire-men of the army or navy for some land, free education was established, special deed of bravery. It was and county councils set up. During founded by Queen Victoria towards land, free education was established, special deed of bravery. It was and county councils set up. During founded by Queen Victoria towards this administration the Liberal distinction of the Crimean War sentients from Home Rule, called (1856). It consists of a Maltese cross Liberal Unionists, generally supmorted the Conservatives. In 1892 the royal crown surmounted by a Gladstone became premier for the lion, and with the scroll superscribed fourth time, and introduced a second 'For Valour.' The winning of the Home Rule Bill. This was defeated V. C. carries with it a pension of £10 in the Lords, and Gladstone retired from leadership and politics. He was circumstances, be made up to £50.

Mosicatunya, 'smoke sounds there'), chief being Bukasa, Sesse, Ukerewe, great waterfalls upon the R. Zabesi, in Rhodesia, Central Africation of the State of the Results of the Results of the Results of the Rustings, and the Rosa; in Rhodesia, Central Africation of the Rosa; in Rhodesia, Central Africation of the Rosa At this point it is some 1860 yds. wide, and then drops over a chasm extending the whole breadth and varying from 250 to nearly 400 ft. Its course through a channel of 100 ft. width, through the 'Boiling Pot,' into the Grand Cañon, now spanned by a splendid bridge. Great clouds of mist rise from the seething waters which rise from the seething waters, which are visible for 20 m. The railway to Buluwayo was opened up in 1905, and the falls are also connected by rail with Cape Town (1642 m.).

Victoria Land was so named after Queen Victoria, and was discovered in 1841 by Captain James Clark Ross. It is a region of the Antarctic lying between 180° and 150° E. long. Ross followed its margin as far as 78° 4′ S. lat. Here are situated Mt. Erebus and Mt. Molbourge, which below to and Mt. Melbourne, which belong to

a lofty chain.

Victoria League. This league was established in 1901 shortly after the Victoria's celebration of Queen Victoria's Diamond Jubilee. Its objects are to promote an intimate understanding and general rapprochement between the people of the United Kingdom and those of the colonies and de-pendencies, to provide literature for settlers in the more outlying colonics, and to act as a centre for the receipt and distribution of information re-in-chic garding the Briti

head office is a 2 Wood Street, ...

managed by a council and exceeding committee, has a membership of over

10,000, and had an income (1910) of over £2000.
Victoria Mount, the culminating point (13,121 ft. high) in the Owen Stanley Range of New Guinea, which wice in the Stanley Range of New Guinea, which

rises in the S.E.

Victorian Order, The Royal, see

ORDERS OF KNIGHTHOOD.

Victoria Nyanza, the largest lake of Africa, having an area of over 26,000 sq. m. As a fresh-water lake it is in size second to Lake Superior alone. The Victoria Nyanza is situated on the equator and bounded by British Uganda and German E. Africa, and forms the chief reservoir of the Nile. On the N.E. lies Kavirondo Bay, and on the S.E. is the large Speke Gulf, and the narrow inlet of Smith Sound

Consult The V.C.: its Heroes and to the S. The chief inlets on the Witheir Valour, by D. H. Parry, 1913.

Victoria Day, see Empire Day.

and Napoleon Gulf. The coast is Victoria Falls, The (native name broken up by numerous islands, the

and the northern part in 1861. Stan-ley sailed round it in 1875 and 1889, and Baumann in 1892. Commander Whitchouse completed his survey of

a thick, fleshy root stock, and huge tray-like leaves from 6-12 ft. in diameter, green above and purple or violet beneath. The flowers are very large and fragrant. It is grown in

tanks in stovehouses.
Victoria University, The, Manchester, was founded in 1880. It was formed from the union of Owens College, University College, Liverpool, and Yorkshire College, Leeds. This constitution continued until 1903. when the Leeds College was formed into a separate university. In the next year Leeds also established its own university. V. U. has a regular course of study for its degrees, and thus

West ica, rail. The town is blue as at account of

4100 ft. Pop. 3000. officiting 2164 Vict · tons, :

1765), altar

ind of Newson in ind Trafalgar (1805). ind Trafalgar (1805). A former Victory was flagship of Sir John Hawkyns at the defeat of the Spanish Armada (1588).

Victualling, see RATIONS.
Victualling Bill, an authorisation issued by the customs house permitting the embarkation by the captain of an outward-bound vessel of such bonded stores as are needed for the

voyage.
Victualling Yards. There are three large naval V. Y. in England: the Royal Victoria at Deptford, the Royal Clarence at Gosport, and the Royal William at Plymouth. There are also the Royal Alexander at

uda, Cape of Wel-hal-Wei,

Vicuña, or Vicugna (Auchenia 40 to 50 ft. high, which has ten regular vicunia), a small ruminant, native of bastions, and forms altogether what Bolivia and N. Chile. Its soft silky fur is called the Bastei, now one of the or wool is brown in colour, and much valued for the manuf. of choice fabrics. The V. is very wild, active, and sure-footed, and is much hunted.

Vida, Marco Girolamo (1490-1566), a Latin poet, born at Cremona. He became a canon of St. John Lateran at Rome; was appointed Prior of St. Silvester, Tivoli, by Pope Leo X., and Bishop of Alba by Clement VII. (1532). His chief poems are: Christias, 1535; De Arte Poelica, and Scaechia

Ludus. See Life by Lancetti, 1840.
Vidal, Peire (fl. 12th century), a
Provencal troubadour, born at Toulouse. He became a favourite at the courts of Alfonso II. of Aragon, Alfonso VIII. of Castile, and Barral, Viscount of Marseilles. He probably went on a crusade with Boniface de Montferrat. His Songs were published by Bartsch (1857). See Life by Schopf, 1887.

Vidocq, Eugène François (1775-1857), a French criminal and detective, born at Arras. He engaged in a series of discreditable escapades, was for a time an acrobat, and served in the army. In 1796 he was convicted of forgery in Paris and sentenced to eight years in the galleys. He escaped and in 1809 entered the secret police of Paris, and in 1812 was made chief of the 'Brigade de Sureté.' In 1832 his private detective office was suppressed. His Mémoires (1829) are of doubtful authenticity.

most favourite promenades of V., commanding a very fine view. The inner or old city is very irregularly built; most of the streets are crooked and narrow. The old city is the most fashionable: it contains the palaces of the emperor, of many of the principal nobility, the public offices, the finest churches, and most of the museums and public collections, the colleges, the exchange, and the most splendid shops. The public buildings, palaces, churches, etc., are very numerous. The cathedral, dedicated to St. Stephen, is a beautiful Gothic structure. The Burg, or imperial palace, is an old irregular edifice built at different times; it contains the imperial jewel office. The Imthe imperial jewel office. perial Library connected with the Burg is a handsome edifice, containabove 300,000 volumes and ing 16,000 manuscripts. The principal establishment for education is the university, founded by Duke Rudolph IV. in 1365. It is attended by above 2000 students, and has 80 professors; has a library of 100,000 volumes, an observatory, a botanic garden, a veterinary school, and other appendages. The Josephinum, founded by Joseph II., is a medical institution for the instruction of surgeons for the army. V. being the centre of the army. Austrian dominions, is likewise the principal seat of commerce and manufactures. The principal manudoubtful authenticity.

Vioira, Antonio (1608-97), a Portu
Vacture's are silk, velvet, shawls, gold
guese missionary, born in Lisbon. He
was educated by the Jesuits at Bahia,
ribbons, carpets, leather, porcelain,
Brazil, and entered the order in 1625.

In 1652 he became director of the
instruments, firearms, gold and silver
Northern missions in Brazil. He was
condemned and imprisoned by the
loves, lace, straw hats, paper, etc.
Inquisition (1665). In 1681 he was
The public promenades, which are mude director of the Jesuit convents the great places of resort for the in Brazil.

Vien, Joseph Marie (1716-1809), a ramparts of the old town; the French painter. He lived chiefly at Glacis, or esplanade between the city Paris, and became a member of the and the suburbs; the Volksgarten French Academy in 1754, while sub- (the people's garden); the private sequently Napoleon made him a count gardens of the palaces of Liechten and a senator, and decorated him stein. Rasumowsky, Schwarzenberg, with the Cross of Commander in the and the Belvedere: and the Prater. Legion of Honour. The Louvre has in the suburb Leopoldstadt, which one of his mythological pictures, while is an immense park. Great lines other works of his are at Montpellier, of railway extend from V., N.N.E. to Versailles, and Orleans.

Vienna, the metropolis of the Austrian empire, situated on the right or S. bank of an arm of the Danube, into S.S. W. (nearly completed) to Trieste. which the little R. Wien discharges Pop. 2,031,498.

Vennests of the interior or old city. France, formed in 1390 out of about

Vicenic in fittle R. Wien discharges Fop. 2001,350.

V. consists of the interior or old city.

V. consists of the interior or old city is four-fifths of Poitou, and of Touraine nearly circular, and not above 3 m. in circumference. It is surrounded Indre on the E. and Deux-Sèvres on by a broad fosse, and a wall from

instance of Justinian, Emperor of the ship lines. East, who had just deposed Sylverius with the Goths. He took a considerable part in the theological controversy known as the 'Three Chapters.' which 'chapters' he refused to condemn until after the Council of

Constantinople. Vigna, Pior della, or Petrus de Vinea (c. 1190-1249), an Italian statesman and jurist, born at Capua. The emperor, Frederick II., appointed him his chancellor, and V. defended him before the Council of Lyons in 1245. He was also legate to the papal and English courts. He was later accused of conspiring against the emperor's life, and condemned to be blinded and imprisoned. His publications include Letters, valuable as a record of the history of the time; Latin and Italian poems, and De Polestate Imperiali. See Life by Huillard-Bréholle, 1864.

Vignette, the name given to a small engraving or design which has not a definite border. It was originally only employed as a term in architecture to designate an ornament of vine leaves

and grapes.

Viznola (Giacomo Barozzi. Barocchi) (1507-73), a celebrated paroceni) (1907-73), a celebrated Italian architect, born at Vignola, near Modena. Succeeded Michelangelo as the architect of St. Peter's, Rome, and designed the Escorial in Spain, and the palace of Cardinal Alexander Farnese at Caparola, near Viterbo. A good deal of his life was spent in France, where he executed grapes of the between the caparola fine between the caparola caparola fine between the caparola caparola fine between the caparola capar spective.

Vigny, Alfred Victor, Comte de gained a victory over the Turks. Pop. (1799-1863), a French poet, born at Loches (Indre-et-Loire). He came of a soldier family, and served in the army for twelve years. He published the transfer of Verona, Italy, 10 m. from Verona army for twelve years. He published the transfer of verona transfer to the following the transfer of the poems, and Journal d'un Poète (1867). Villa Franca do Campo, a seaport V.'s reputation rests on his poems, of the Azores in São Miguel Is., on and he possessed poetical qualities of the S. coast, with sulphur springs a rare nature. See Lives by Paléo. Pop. 7500. Asse (1895), logue (1891).and: Lauvrière (1910).

Vigo, a scaport and fort, th. of dist, of Cambudos, Pop. 8000.

Spain, on the Rio de Vigo. It has a deep and spacious harbour, and important sardine and other fisheries, prictary relation to a district divided and is a port of call of several steaming.

Village Shipbuilding is also carried on, and there are tanneries. on a charge of having corresponded soap works, distilleries, flour and paper mills, and sugar refineries. The town was attacked by Drake towards the end of the 16th century, and in 1702 the allied Anglo-Dutch fleet sank the French and Spanish ships and the Spanish treasure fleet from America. Pop. 26,000.
Vigors, Nicholas Aylward (1787-

Vigors, Nicholas Aylward (1787-1840), an Irish zoologist, born at Old Leighlin, co. Carlow. Having purchased an ensigncy in the Grenadier Guards (1809), he served in the Peninsular War, being wounded in 1811, when he left the army and devoted himself to the study of birds and insects. He to the study of birds and insects. He took an active part in forming the Zoological Society, and was its first secretary, and to this society he presented his collections. He published various papers on birds (1825-39).

Vihara, see ARCHITECTURE-India. Vijayanagar, see BIJAYANAGAR. Vikings, another name for Norse-

men (q.v.).

Vikramorvasi, see Kalidasa

Vilayet, an administrative div. or prov. of the Turkish empire.

Vilhelmina, a tn. in the län of Vesterbotten, Sweden, about 115 m. W.N.W. of Umea. Pop. 7368. Vilkomir (Polish Wilkomierz), a tn. of Russia in the gov. of Kovno, 40 m. N.E. of Kovno. It has trade in flax. Pop. 16,000.

Villach, a tn. of Austria on the Drave, in the prov. of Carinthia, with manufs. of lead, cement, colours, and chemicals. There are hot sulphur several fine bronzes. He wrote baths in the vicinity, and about 9 m. treatises on architecture and per- to the W. are the lead mines of Bleiberg. Here, in 1492, the Germans

four years later his famous prose and the Emperor Francis Joseph after romance Cinq-Mars, followed by the battle of Solferino. Pop. about Poèmes Antiques et Modernes. In 5300. 2. A tr. in Piedmont on the Po; 1832 appeared his drama of Chatter- famous for its silk industries. Pop. 1832 appeared his drama of Chauer-lamous for its sink maustries. Fop. fon, and amongst his other dramatic about 10,000. 3. A fort, th. and trading work may be mentioned: Quitte pour port of France in the dept. Alpesla Pour and Shylock, an adaptation of Maritimes, on the Gulf of Nice. It is The Merchant of Venice. He left a the station for the French Mediter-volume of verse, entitled Les Destracted in the winter, and has lines (1864), containing some fine marble quarries. Pop. (com.) 5000.

Villagarcia, a tn. in the prov. of Pontevedra, Spain, situated in the dist. of Cambados. Pop. 8000. Village Community, consisted of a

tions were: the mark of the township of Barcelona, with manufactures of or village, the common mark or waste, cotton, paper, lace, and soap. and the arable mark or cultivated area. The community inhabited the village, held the common mark in mixed ownership, and cultivated the arable mark in lots appropriated to the several families. Each family was governed by its own head, who made law within his house and enforced it without, but he stood in a number of intricate relations to the other heads of families, so that the rights of one family over the common mark were controlled by the rights of every other family. Thus, when a householder felled wood or grazed cattle in the common forest an officer watched to see that the common domain was equally enjoyed. Again, in the arable d his own hree fields

Teutonic invariably otation of

crops), but he could not cultivate as he liked. He had to sow the same erop as the rest of the community and allow his lot in the uncultivated field to lie fallow with the others; i.e., he must do nothing to interfere with the right of the other Village households. See Maine, Communities in the East and West.

Villa Mercedes, a tn. in the prov. of

San Luis, Argentine Republic, 58 m. S.E. of San Luis. Pop. 5500. Villani, Giovanni (c. 1275-1348), an Italian chronicler, born at Florence. He spent some time in travel, being engaged in commerce, and visited France and Flanders, following all the movements of the war between Philip the Fair and the Flemings. His the Fair and the Fiemings. His cipal opponent of catallar great work, Historic Florontine or and took the field for the last time in Cronica Universale, was suggested by the War of the Polish Succession a visit to Rome at the jubilee of 1300. (1734). He was one of the greatest This begins w

comes down to chronicle exten It is Europe. early mediæva

early mediewed besides being very important for less are large yearly mediewed besides being very important for less are large yearly mediewed by Matteo V., his situated on the Strait of Messina, brother, and Matteo's son, Filippo V., who take the chronicle down to 1364.

Villa Nova de Gaia, see Gaia, VIII.a. Nova DE.

Nova DE.

NOVA DE.

Villanueva: 1. A tn. of Spain in the prov. of Andalusia, 28 m. from Malaga. Pop. 5000. 2. A com. of Spain in Galicia, 12 m. from Pontervedra. Pop. 7000.

Villanueva de la Serena, a thriving the Villanueva de la Serena, a Checken.

tn. of W. Spain in the prov. of Badajoz, noted for its wine and fruit,

12,000. Villa Real, a tn. of Portugal, 45 m. from Oporto. It is the capital of the prov. of Villa Real, and has trade in live stock, wine, and mineral waters. Pop. 6800.

Villareal, a tn. in the prov. of Castellon, Spain, 4 m. S. of Castellon de

la Plana. Pop. 16,500.
Villa Real de Santo Antonio, a ta.
and port of Portugal in the dist, of Faro, near the famous copper mines

of São Domingo. Pop. 5200.
Villa Rica, a tn. in Puraguay, 73
m. E.S.E. of Asuncion. It is chiefly noted for the manufacture of tobacco. Pop. 25,000.

Villa Rosa, a tu. in Sicily, 11 m. N.E. of Caltanisetta. Pop. (com.)

12,300.
Villars, Claude Louis Hector, Duc de (1653-1734), a marshal of France. born at Moulins. He served in the Dutch wars and also helped the Elector of Bavaria against the Turks, and in 1702 defeated the Margrave of Baden at Friedlingen. For this victory he was made a matshal, and in 1709 was sent to command the main army opposing Eugene and Mariborough on the N. frontier, but was wounded at Malplaquet. He was at the head of the last army France could raise, and saved his country by his victory at Denain (1712), when he fell upon the British and Dutch under Albemarle and drove Prince Engene under the walls of Brussels, negotiating the Peace of Rastatt (1714). He played a conspicuous part in the pollties of the regency period as the principal opponent of Cardinal Dubois,

a genus of aquatic or nts (order Gentlanacea). V. has cordate floating large yellow-fringed flow-

It is the only British species.

Villefranche, a tn. of France in the Rhône dept., on the Saone, noted for its cloth (Beaufolnis), wine, and

Pop. 16,000. cattle.

Villefranche-de-Rouergne, a tn. of France in the dept. of Aveyron, on the R. Aveyron. There are manufactures of hemp, and phosphate quarries, sulespecially melons. Pop. 13,500. hhur springs, and tin and argenti-Villanueva-y-Geltru, a scaport tn. ferous lead mines are in the vicinity, on the E. coast of Spain in the prov. The church of Notre Dame, with its

Villegas

French Academy. In 1816 he was appointed to a chair of modern his trade in plums, cattle, horses, wine, tory at the Sorbonne, as assistant to and market garden produce. Pop. Guizot. In 1827 he, along with Lacretelle and Chateaubriand, drew up the petition addressed by the French Academy to Charles X. against the son of Marquis de V., marshal of ree-establishment of the censorship of France. He was brought up with the press. V. held the portfolio of favourite, and in 1693 rose to be Soult (1839-40) and Guizot (1840-44). In arshal of France. But he showed His principal works are: Cours de Litter of the content of the censorship of Siècle, and Soutenirs Conlemporains. Villemarqué, see La Villemarqué, see La Villemarqué, see La Villemarqué, Marlborough at Ramillies, 1706, after Vicontil De.

Vicontil De.

Villemomble, a tn. in the dept. of
Seine, France, having gypsum quariof Alsne, France, and the birthplace riePop. about 5000.

Villena, a tn. in the prov. of Ali5300.

massive tower, dates from the 13th cante, Spain, about 30 m. N.W. of Alicentury. Pop. (com.) 8300. cante. The chief product is salt.

massive tower, dates from the 13th century. Pop. (com.) 8300.

Villegas, Esteban Manuel de (1596-1669), a Spanish lyric poet, born in Castile. He practised for some time as a lawyer at Nájera, but in 1639 he was accused of expressing unorthodox views on the subject of free-will, and exiled. He published Las Erotranslations from Horace and Anacreon, and of original poems, as well as a version of Boethius, 1665.

Villehardouin, Geoffroi de (c. 1160-6. 1213), the first French historian, born in Aube. He took part in the Fourth Crusade, was several times and several times and its effects; and a translations of the table; Libro and its effects; and a translations of the subject of free-will, and devoted himself to literature. Trabajos de Hércules, a pedantic allegory: Tratado de la Consolacion; will have the first french historian, born in Aube. He took part in the Fourth Crusade, was several times evil eye and its effects; and a translations.

vinenarooun, Geoiffol de (c. 1100)

2. 1213), the first French historian, born in Aube. He took part in the Fourth Crusade, was several times employed in negotiations, witnessed the capture of Constantinople in 1204, and was appointed by the Emperor Baldwin marshal of Romania. He afterwards served the Emperor Henry, commanding under him in a naval battle at the fortress of Cibotus, and received the fiel of Messinopolis. His Histoire de la Prise de Constantinople par les Français et les Vénitiens is a valuable record of the events of the crusade from 1193-1207. The first printed edition appeared in 1585; subsequent edition appeared in 1585; subsequent dedition appeared in 1585; subsequent deditions are by De Wally (1874) and Bouchet (1891).

Villein, in feudal law, one who held lands by base or servile tenure. Vs. are generally believed to have been either (1) regardant or adscriptitic gleba, i.e. attached to the soil: or (2) in gross, i.e. annexed to the person of their lord, but Vinogradoff would seem to have disposed of this legal fiction. The system of villeinage gradually died out after Wat Tyler's rebellion in 1381. See Vinogradoff's I'llcinage in England.

Villenmain, Abel François (1790-1867), a distinguished French politician and writer, born at Paris. During the years 1812-16, three of his literary essays were crowned by the French Academy. In 1816 he was appointed to a chair of modern history the Robert of Market garden produce. Pop. 6 Guizot In 1887 he along with James.

Villerupt, a tn. in the dept. of in Dauphine, but in 1461 he was

chief manufs, are liqueurs and chemi-Pop. 34,000.

Villiers, see Clarendon, George William Frederick Villiers.

Villiers, see Buckingham, George VILLIERS, Duke of.

Villiers, Charles Pelham (1802-98), an English statesman, grandson of the first Earl of Clarendon and a contemporary of Gladstone, born in London. He identified himself with Cobden and Bright in the passing of the Ballot Act and in the free trade movement. From 1835-98 he repre-Wolverhampton in parlia-

Law Board (1859-66).

Philippe Villiers de l'Isle-Adam, Auguste Mathias, Comte de (1840-89), a French poet, born in Brittany. He was descended from the last grand-master of the Knights of Malta, and gained a reputation both as a satirist and a poet. Among his works are: Axel; Le Nouveau Monde; La Révolte; Le Secret de l'Échafaud; Morgane; Isis Contes cruels, a fine volume of short stories; L'Eve future an amazing piece of buffoonery satirising the pretensions of science.

Villingen, a tn. in the Black Forest, Baden, Germany, 40 m. N.W. of Constance. It manufs. clocks and pottery.

Pop. 10.926.

Villoison, Jean Baptiste Gaspard d'Ansse de (1750-1805), a French classical scholar, born in Corbeil-sur-Seine, and at a very early age acquired a reputation for his knowledge of Greek. In 1773 he published from interest. It is an important centre an MS, at St. Germain the first edi- for timber and grain, which are extion of Apollonius's Lexicon on ported, and an archiepiscopal see of the Riad and Odyssey, together with the Orthodox Greek Church, besides fragments of Philon Venice (1778) and c

St. Mark library an containing Riad, Scholia, and in 1. Constantinople. Greece and in the

wrote numerous great works, the chief of which is Anecdola Graca.

Villon, François (1431-c. 1485), French poet, born of poor parents in Pop. 700. Paris. At an early age he became a Vinaroz, a tn. in the prov. of Student in arts, and by 1452 had Castellon de la Plana, Spain near the taken his M.A. degr taken his M.A. degr

little is known of him t he was sentenced to killing a priest in a str

saw him again in tr
saw him again in tr
self mainly with stillfollowing year he was accused of highly esteemed. Some are in the
burglars, and sentenced, with others, to be hanged. Having appealed, he
was banished and went to Roussillon pal Museum.

Meurthe-et-Moselle, France, having again caucht at his old came and imblast furnaces. Pop. 6800. prisoned at Meung-sur-Loire. Being Villeurbanne, a tn. in the dept. of released he was promptly involved in Rhone, France, 3 m. E. of Lyons. The a street quarrel and again arrested. tortured, and condemned to be hanged, but the sentence was commuted to banishment, 1463, and from this time V. passes from history. He was the author of Grand Testa-ment, Petit Testament, and some forty or fifty short pieces, chiefly ballades, notably: Ballade des Dames du Temps Jadis; La Grosse Margel; du Temps Jaans; La Grosse Jacque, Ballade des Pendus; Ballade pour sa Mère; Regrets de la Belle Heaulmière. The best modern editions of V.'s poems are those of Paul Lacroix, Pierre Jannet, Longnon (1892). sented Wolverhampton in parlia-Moland (1893), and II, de Verement, and was president of the Poor Stacpool (1913). See Pierre Chainpion, François Villon, sa Vie et son Temps, 1913.

Vilna, a gov. of European Russia, area 16,100 sq. m., consists of an extensive plain broken with low hills. The low land is marshy, and the country is covered with forest. The rivers are mainly tributaries of the Niemen. The soil is sandy, and the chief occupation is agriculture. barley, wheat, oats, hemp, and tlax are grown, and timber and furs ex-

ported. Pop. 1,807,000.

Vilna, a tn. of Russia, cap. of the gov. Vilna, on the Viliya R., near the junction of Libau-Don, St. Petersburg-Warsaw, and Libau-Odessa rall-An old town, it contains an ways. imperial palace, the cathedral of St. Stanislaus (1387), the cathedral of St. Nicholas, built 1596-1601, besides a valuable museum of antiquities, and various other buildings of historical interest. It is an important centre of the aithmanian

> , a tn. in Belglum. Has tan-16,000.

Portugal, the place at which Welling-a ton defeated the French in *180s.

PERIWINKLE

tor (d. 1871), a French ve of Puy-de-Dome; he

Vincennes: 1. A tn. of France in the phlets, sermons, and treatises dept. of Seine, 21 m. E. of Paris. Its ancient geography, and superintended celebrated castle, which now serves as a fort, arsenal, and barracks, was built by Philip of Valois, John, and Charles V., on the site of a feudal fortress founded in 1164 by Louis VIL. The Bois de Vincennes lies between the fortifications of Paris and the right bank of the Marne. V. has manufs, of chemicals, pianos, organs, metal plates, perfumery, and mineral waters. Pop. (com.) 34,000. 2. A city of Indiana, U.S.A., co. seat of Knox co., on the Wabash R. It has a Roman Catholic cathedral (1835) and a university (1896), and is a railway and manufacturing centre, with flour mills, starch factory, iron foun-dries, and machine shops. Pop. (1910)

14,895.
Vincent, Saint (d. 204), a deacon and martyr, who suffered under the persecution of Diocletian. He was a native of Spain, and was educated by Valerius, Bishop of Saragossa, who ordained him deacon. For professing his faith he was taken to Valencia and put to death. His festival is cele-

brated on Jan. 22. Vincent, Sir Charles Edward Howard (1849-1908), an English politician, born at Slinfold, Sussex. born at Slinfold, Sussex. He was educated at Westminster and Sandhurst, and in 1871 went to Berlin as special correspondent of the Daily Telegraph, again representing that paper in 1876 on the outbreak of the Russo-Turkish War. Having made a study of the questions of law and police, he was, in 1878, made director of criminal investigation at Scotland Yard, and while holding this office reorganised the detective department
of the London police system and
the governor of Upper Germany,
published A Police Code and Manual
of Criminal Law (1882). In 1885 he
was elected member for Sheffield, and
V. committed suicide. became known as an unwavering ad-United Empire Trade League in 1891. by the territory of the Helvetii, on He also helped to form the volunteer the S. by Rhætia, and on the E. by contingents for the South African the R. Enus (Inn). It was con-War (1899), and from 1884-1904 was quered by Tiberius in the reign of contingents for the South African War (1899), and from 1884-1904 was colonel commandant of Queen's Westminster Volunteers. He published: Elementary Military Geography. Reconnoitring, and Sketching; Russia's

the restoration works in Westminster

Abbey.

Vincent de Paul, St. (1576-1660), a Vincent de Paul, St. (1976-1600), a French divine and philanthropist, born at Pouy, France. He was or-dained priest in 1600, but on a journey to Marseilles in 1604 he was taken prisoner by Turkish pirates and carried off to Tunis, where he was sold as a slave. He served three masters, but the last one liberated him in 1607. He returned to Paris in 1609, became cure of Clichy, and then tutor to the children of the Gondi family. He soon devoted himsolf to the relief of the poor, establishing what he called 'confréries de charité' in various towns in France. In 1625 he founded the Congregation of Mission Priests to train preachers who were to act as assistants to the regular clergy; and in 1632 the Mission of the Sisters of Charity, who devoted themselves especially to the care of the sick. He was canonised in 1739. Vincent of Beauvais (c. 1190-c.1264),

Dominican monk, who was regarded as the precursor of the en-cyclopædists. He compiled a summary of general knowledge under the title of Speculum Majus; was reader to Louis IX., and tutor to his

children.

Vinci, see LEONARDO DA VINCI. Vindex, Gaius Julius, was proprætor of Gallia Celtica in the reign of the Emperor Nero. He rebelled against the authority of Nero in 68 A.D., being the first of the Roman

V. committed suicide. Vindelicia, a Roman prov., bounded vocate of protection, founding the on the N. by the Danube, on the W. United Empire Trade League in 1891. by the territory of the Helvetii, on

Augustus.

Vindhya Mountains, a series of mountain ranges in Central India, connecting at the extremities with

Advance Eastward; The Year Book of the Book of Criticism and Lihel. The plant, a native of Asia, and cultifluorad Vincent Map of the Brilish vated from a remote period for its Empire was published in 1887 (19th fruit, which, besides being one of the ed., 1912, under the auspices of the learner was published in the discount of the choicest dessert fruits, is made into wine and other alcoholic liquors, while the dried fruits of certain varieof Westminster, born in London. He ties furnish raisins and currants, was usher at Westminster, 1761; The V. was formerly much planted second master, 1771; and head master, against sunny sheltered walls in 1788-1802. He was dean of West-the S. of England, but its production minster, 1802-15. He published pam-of fair-sized fruit is irregular. In a

greenhouse its culture is easy; the been in a great measure the result of roots are generally set in a border his writings in favour of the separation of church and state. arches or through holes into the house, where the shoots are trained up the roof. By control of the temperature, and management of ventilation, fruit can be ripened, according

to variety, over a large scason. Vinegar, a weak solution of acetic acid containing colouring matter, and is obtained by the acetous fermentation of poor wine, sour beer, or other dilute alcoholic liquids. In the French or Orleans process, a small quantity of wine is placed in large vats covered with perforated lids. The vats are previously scaked inside with hot V., and the ferment (mycoderma aceti) soon gets into the wine. Periodical additions of wine are made until the cask is about half full. The V. obtained is then drawn off and the operations repeated. In the German or 'quick' V. process diluted raw spirit (6 to 10 per cent. of alcohol) with beer or malt extract is allowed to trickle through perforated vats beech wood shavings, containing which are covered with the ferment. V. by the French process contains 6 to 10 per cent. of acetic acid, whereas that from the quick process contains only 4 to 6 per cent. White V. is obtained from inferior wines, while malt V. is prepared from beer. Vinegar Hill, a mountain in Ireland,

14 m. from Wexford, where, in 1798, the Irish rebels were defeated by

General Lake.

Vineland, a bor. in Cumberland co.,

Vineland, a bor, in Cumberland co., New Jersey, U.S.A., 34 m. S.S.E. of Philadelphia. Chief manufs. boots, shoes, and clothing. Pop. (1910) 5282. Viner, Charles (1678-1756), an English jurist, born in Salisbury. He compiled A General Abridgment of Law and Equily in 23 vols., devoting half a century to this work. It was based on the work of Henry Rolle, but was of little value before the publication of an Alphabelical Index publication of an Alphabetical Index by Robert Kelham in 1758. He also founded the Vinerian common law professorship, scholarships, and fel-lowships at Oxford. Vinet, Alexandre Rodolphe (1797-1847), a Swiss divine and author, born at Lausanne. At the are of

twenty he was appointed professor of French language and literature at Basel. This position he held till 1837 when he removed to Lausanne, to all the chair of practical theology in the academy of that city, which chair, however, he resigned in 1840, when he seceded from the national church. V. took a leading part in the forma-tion of the Free Church of Yaud, formed by seceders from the national church in 1845, this secession having

Vingt-et-Un, see GAMBLING. Vinh-long, a tn. of Lower Cochin-China, on the R. Mekong, about 65 m.

S.W. of Saigon. Vinje, Aasmund Olafssön (1818-70). a Norwegian poet, was the principal leader of the movement known as the maalstraev, which was an effort to distinguish Norwegian from Danish literature by the adoption of a peasant dialect. V., who was by birth a peasant and a man of remarkable talent, wrote a volume of lyrics, published in 1864, and Storeaut (1866), a narrative poem in this fictitious language. He also issued it in a newspaper Dolen, a weekly review, which, 1858-70. published from quickly made him famous. Another work of his was A Norseman's Views of Britain and the British, 1863.

Vinland, a name given by the Norsemen to the part of America discovered by them, because of the abundance of grapes there. Sighted by Blarni Herjulisson (986), and ex-

Supposed Norse inscriptions have been found at Newport and at

is by no means conclusive. In the Saga of Red Erik we are told that from its products Lelf gave the land In the a name, and called it Wincland, and that 'their afterboat was filled with grapes.' See A. M. Reeves, The Find-ing of Wineland the Good, 1890, which contains excellent translations of the two Icelandic sagas in which finding is recorded, and carefully compiled historical information.

Vinnitsa, a tn. in Podolla, Russia, 85 m. E.N.E. of Kamenets, Pop.

30,000. Viol (It. viola), the generic name for the group of stringed instruments of the 15th to the 17th centuries pre-ceding modern types. The V. was ceding modern types. made in four sizes, and had from five to seven strings, tuned in thirds and fourths: (i) the troble or discant; (ii) alto, tenor, or viola da baccio: (ili) bass, viola de gamba—corre-ponding respectively to the modern viola, viola, and violoncello: and (iv) the contra or double bass, still in use.

Viola, a genus of perennial plants (order Violacce) which includes not only the violet (V. odorah) but also the pansy (V. tricolor) and the tufted pansies or florists' Vs., which are among the most adaptive of garden

plants. Viola, or Tenor Violin, see VIOLIN.

and shrubs of wide distribution. Many of them possess emetic properties.

Violet, the name of a number of British plants, including the sweet V., marsh V., hairy V., dog V., and mountain V. Many of them are interesting for their production of cleistogene flowers, yielding an abundance of seed in autumn: while the conspicuous familiar spring flowers vield little or no seed.

Violin, a stringed musical instrument played with the bow, and the most important of its class. It confists of a resonant wooden box called the body; the neck, a solid piece of wood to which is attached the fingerboard; and the strings, fastened at one end to the lower part of the body, by means of a projecting tailpiece, and at the other to pegs in the head, the scroll-like termination of the neck. The body consists of two thin, arched pieces of wood joined by side-pieces, or ribs, to form a shallow lox. The top surface, or belly, is made of a soft wood, pine or fir. The under surface, or back, is generally of maple or sycamore, as are the ribs. The body is so constructed that there are two deep inward curves in its sides, nearly opposite the portion of the strings on which the bow plays. The neck also is of maple, glued and mortised to a block fixed in the upper part of the body. The tail-piece and finger-board are of ebony, this hard wood being specially necessary in the latter case to prevent the finger-board from being worn into hollows by the by Stradivarius. Under the right foot of the bridge—or rather a little way behind it—is the sound-post, a small rounded bar of soft pine, joining the back and belly of the instrument, and serving the double purpose of supporting the pressure of the strings and communicating the vibrations to the Without the sound-post the back. poor quality. The bass-bar is a strip of wood glued to the inside of the V., and passing under the left foot of the bridge. The strings are of catgut and are tuned in fifths, the highest, or first string, sounding the E on the fourth space of the treble clef, and the other three the A. D. and G. In order that the fourth string may not be too thick, the requisite weight

Violaceæ, a natural order of plants seventy pieces of wood used in the and shrubs of wide distribution. construction of the V., though the number may vary. Curiously enough, since the time of the early Italian masters there has been scarcely any alteration in the shape of the V., and modern makers are still following the model of Stradivarius, and endeavour unsuccessfully to reproduce his exquisite tone, which is often supposed to be the result of a secret varnish. but which may be more sensibly attributed to the untiring efforts and experiments to which the old Italian makers devoted their lives. The viola. violoncello, and double bass may conveniently be studied beside the V., for not only do they belong to the same family, but they are very similar in construction, and show only minor variations, while the history of all four instruments runs on parallel lines. The viola is slightly larger than the V., and also comparatively thicker. It is tuned in fifths and a fifth below the V. Music for is called the ten ten on the C

tone is somewhat grave and melancholy, and its quality has an attractiveness quite different from charm of the V. The violoncel The violencelle is much larger than either V. or viola, and is held between the player's knees. Like the others, it has four gut strings, but in this case the two lower strings are generally silvercovered. The signature is the bass clef, and it is tuned in fifths, an octave below the viola. The double-bass is largest of all, having a deep, rough tone. It differs somewhat from player's fingers. Sound-holes are cut, the other stringed instruments chiefly in the belly in the form of an f on in having sloping shoulders, and in either side of the bridge. The bridge being differently tuned. Formerly it-elf is of maple, cut in a peculiar double-basses had only three strings shape, which has remained practituded in fifths—A. D. G. on the bass shape, which has remained practistant in the has cally unaltered since its introduction stave—but a fourth string is now by Stradivarius. Under the right foot usually added, sounding the E below of the bridge—or rather a little way the stranger of the bridge—or rather a little way the stranger of the bridge—or rather a little way the stranger of the bridge—or rather a little way the stranger of the bridge—or rather a little way the stranger of the bridge—or rather a little way the stranger of the bridge—or rather a little way the stranger of the bridge—or rather a little way the stranger of the bridge of the br the stave, and the strings are tuned in fourths—E, A, D, G. The mute is a contrivance for fixing on the bridge of all stringed instruments to deaden the sound. It produces a dull, veiled note, which, when properly used, is very effective. In following the his-tory of the V. it is necessary to note tone would be very weak and of a the distinction between plucked and hey are, in fact, origin.

stringed instruments played with a bow were used in Asia at a very early date, the oldest known form being the raranastron, a hollow cylinder of wood, with serpent-skin stretched on one side, and strings fastened to a wooden rod. It was played with a bow of bamboo is obtained by covering a thin gut and horse-hair. To this curious instring with fine silver wire, or copper strument Indian tradition assigns the wire silvered. In all there are about date 5000 n.c., when it was said to

Viollet have been invented by Ravana, King of Ceylon. The assumption that the Welsh cruth was the forerunner of the V., because it was latterly played ledged to be the greatest contemwith a bow, appears to be erroneous. The earliest form in which the Asiatic instrument reached Europe was the instrument reached Europe was the Persian or Arabian rebab, which defences of Paris during the siege. Persian or Arabian rebab, which became the French rebek, of which a drawing appears in an MS. of the Abbé Gerbert, early in the 9th century. The next development was the tury. The next development was the viol, which was the immediate precursor of the V. A lute-maker of Brescia, Johann Kerlino, was said to have manufactured Vs. as early as 1449, in which case he was certainly the founder of the Brescian school. But the first maker who is known to have produced the V. as we now have it was Gaspar da Salo, who worked about 1560. His Vs. were large, very arched, and varnished dark brown. After him came the Brescian school—Maggini, Zanetto, Peregrino, Raphael, and others. Early in the 16th century Andreas Amati founded 16th century Andreas Amati founded the Cremona school. He made some improvements, but accomplished less than did his sons, Antonio Jerome. The most famous member of this family was Nicolo, son of Jerome, who taught the still more famous Antonio Stradivarius (1644-1737). The latter set the standard for succeeding generations, and most of the Vs. now made are modelled on His instruments are of a singularly beautiful tone, which has hitherto baffled the efforts of the most Among his pupils the foremost were Others of the genus are the horned V Carlo Bergonzi and Giusepi expert of his imitators to reproduce.

nerius. In the family of the there were many V. makers, successful being Joseph Antonerius (b. 1683). Of modern names the best known is Vuillaume, of Paris. The letter site has also produced the

The latter city has also produced the most famous maker of V. bows—François Tourte (c. 1780). Among the greatest composers of V. music are Tartini, Viotti, Corelli, and

the most promise (the great oxponents, while in their great exponents, while in their great oxponents, while in the great oxponents is a supplier oxponent oxponents oxponents, while it is a supplier oxponent oxponents oxponents, while it is a supplier oxponents oxponents oxponents oxpo

same nt and tra-Was in :

tion of many churches, ganting and at Aricla.

After the war he became a violent Republican and in 1874 was elected to the Paris municipal council. His admission of being a freethinker lost him his positions in connection with church architecture. He wrote many works, distinguished for vigour and polish, including a great Dictionary of French Architecture (1851-68), and various essays and books on architectural subjects. See Life by

archiectural subjects. See Life by Saint-Paul (1881). His letters have been edited by his son (1902).

Violoncello, or 'Cello, see Violan.
Vionville, a vil. of Lorraine, about 12 m. W. of Metz. It is famous for the battle fought there between the French and Germans in 1870, and known also as Martin-Tour

known also as Mars-la-Tour. Viotti, Giovanni Battista (1753-1824), the father of modern violin-

artistic toured 1 Lon.

don, and was opera-director at Paris (1819-22). He left thirty concertos, many sonatas and quartets which are still admired.

(Viperidæ), a family poisonous snakes, most abundant in Africa and S.W. Asia. The common V. or adder (q.v.) (Vipera berus) is the only poisonous British snake. and Russell's V. (V.

rattlesnakes are also family

s, or Echium vulgaris, handsome British plant (order Bornginacem) with bristly stems and leaves; and spikes of flowers which are at first rose colour, later turning

Vipsania the daughte spohr; while of performers some of the most prominent are Paganini (the gre other). The control of the most prominent are Paganini (the gre other). The control of the most prominent are Paganini (the gre other). The control of the most prominent are Paganini became the wife of Asinius Gallus, other other).

same as Hippolytus, ed to life by Asculatest of Diana. He was . . th Dlana in the grove

Virbius

of inquiry in Upper
burg (1848) on account of political views. In 1856 he became professor the Georgica, was undertaken at the of pathological anatomy in Berlin. His Cellular Pathology was published in 1858; two other volumes, Die Krankhaften Geschwülste, between 1863 and 1867; Vier Reden üher Leben und Kranksein appeared in 1862; Lehre von den Trichinen in 1865. He was the first to consider all 1862: Lehre von den Trichtnen in 1865. He was the first to consider all tissue as formed of colonies of cells, and to show that the study of their life history was the true basis of medicine. He was keenly interested

in anthropology, and was president German Anthropological from 1869. The Royal

Society from 1869. The Royal Society in England awarded him the Copley medal (1892), and he was Croonian lecturer in 1893. In 1898 delivered the second Huxley morial lecture. Politically he was

very active, and was elected (1862) a member of the Prussian Lower House. He entered the Reichstag (1880), and

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the

memorial lecture.

became leader of the opposition and an opponent of Bismarck. Vire, a tn. of France in the dept. Calvados, with a castle built by Henry I of England in the 12th century. There is also the picturesque. Tour de l'Horloge (13th century), the church (13th, 14th, and 16th cen-turies), and the town-hall (17th century) containing a fine collection of porcelain and pictures. V. exports butter, and has manufs. of hosiery, cloth, and woollens. Pop. (1996)

6228.

Virchow, Rudolf (1821-1902), born was deprived of his property; but it at Schwelbein in Pomerania. In 1839 was afterwards restored at the comhe went to Berlin, and took his mand of Octavian. It is supposed doctor's degree in 1843. With Reinhardt he founded the Archiv. für palh. stands first in our editions to commember of the was a memorate his gratitude to Octavian. We probably became acquainted with Missense acquainted with Mæcenas soon after writing his Eclogues, in which Mæcenas is not



A passage in the 7th book (606) ap-Virgil, Polydore, see Vergil...

Virgil, Virgilius, or Vergilius Maro,
P. (70-19 p.C.). a Roman poet, born event belongs to 20. When Augustus on Oct. 15 near Mantua in Cisalpine was returning from Samos, where he Gaul. He was educated at Cremona had spent the winter of 20, he met V. and Mediolanum (Milan), and he at Athens. The poet, it is said, had took the toga virilis at Cremona in 55.

It is said that he subsequently but he accompanied the emperor to studied at Neapolis (Naples) under Megara, and thence to Italy. His Parthenius, a native of Bithynia, health, which had been long declination whom he learned Greek. He inc., was now completely broken, and Parthenius, a native of Bithynia, health, which had been long declination whom he learned Greek. He ing, was now completely broken, and was also instructed by Syron, an he died soon after his arrival at Epicurean, and probably at Rome. Was writings prove that he received a learned education, and traces of Besides the Bucolica, Georgica, and Epicurean opinions are apparent in them. After completing his education, After completing his education, appears to have retired to his paternal farm, and here he may have been the productions of his paternal farm, and here he may have written some of the small pleess written some of the small pleess which are attributed to him. In the Georgica is both the most finished division of land among the soldiers and the most original. The Eneid is after the battle of Philippi (42). V. the great national cpic of the Romans.

It is said to have been left unfinished, result both camp and city rose against and Varius after V.'s death. The poem consists of twelve books, which contain the story of the wanderings of Eneas after the fall of Troy, and his final settlement in Latium. glories of Rome and the fortune of the Julian house, to which Augustus belonged, are skilfully interwoven in the texture of the poem. V. must be considered as by far the first of all the Roman epic poets. Best editions of V.: Conington (in 3 vols.), with Eng-y's Encidea.

Sellar's fine

and sympathetic volume of studies (2nd ed. 1883); Comparetti's Virgil in the Middle Ages (English ed. 1895).

Virginal, see Spinet. Virginia, one of the thirteen origi-

nal states c bounded on and on the

has an area of 42,627 sq. m., and is divided into: Tidewater V., the lowlying region along the coast: Middle V., a great triangular plain much divided by its many rivers; the Picd-mont strip, and the Blue and Mountain Ridges, with the valley region between. Agriculture is largely carried on; the chief crops being Indian corn, wheat, oats, barley, rye, buckwheat, a number of climbing plants, and potatoes, hay, cotton, and tobacco. especially to Ampelopsis reilchii, a But manufacturing establishments beautifully foliaged, hardy. and But manufacturing establishments beautifully are increas:

industries products, t flour and state also

and shoes, fertilisers, cars, foundry and machine-shop products, and iron and steel from blast furnaces. Among important minerals are coal, pig-iron, zinc, lead, and gold. The 1500 m. of tidal shore on the Atlantic, Chesapeake Bay, and the entering rivers have important fisheries, especially of oysters. The chief ports are Nor-folk and Newport News, on Hamp-ton Roads, formed by the estuary of the James, on which river stand Richmond, the largest city and capital, and other important cities. (1910) 2,061,612. --- TT C A

Virgini: which has

the last

(1910) was 10,475. suomma an of about 7500 in ten years.

Virginia, the daughter of L. Virginius, a Roman centurion. Her beauty excited the lust of the decemvir Appins Claudius, who instigated one of his clients to claim her as his slave. In order to preserve her innocence her father stabbed V. As a tween 64 10° and 65° 30° W., and 17° tween 64 10° and 65° 30° W., and 17° tween 64 10° and 65° 30° W., and 17° tween 64 10° and 65° 30° W., and 17° tween 64 10° and 65° 30° W., and 17° tween 64 10° and 65° 30° W., and 17° tween 64 10° and 65° 30° W., and 17° tween 64 10° and 65° 30° W., and 18° tween 64 10° and 65° 30° W., and 18° tween 64 10° and 65° 30° W., and 18° tween 64 10° and 65° 30° W., and 18° tween 64 10° and 65° 30° W.

and to have been published by Tucca the decemvirs, and the old form of government was restored.

Macaulay, Lays of Ancient Rome.
Virginia, West, one of the United
States, separated from Virginia in 1861.
It has an area of 24,170 sq. m. and
is bounded on the N. by the Potemac and Ohio Rs., while the Alleghany Mts. form most of the eastern frontier. The climate is agreeable and healthy. Agriculture employs most of the population, the chief crops being Indian corn, wheat, oats, rye, buckwheat, potatoes, hay, and tobacco: but flour milling is also largely carried on, and there are manufs, of lumber and timber, leather, glass, coke, cars, and iron and steel goods. Carboniferous rocks cover most of the state; they yield coal extensively over large areas (W. V. ranked second in quan-tity of coal in 1911), and petroleum. Clay, stone, lime, sand, gravel, and iron ore are also among the minerals. Pop. (1910) 1,221,119.

Virginia City, a city and co. sent of Storey co., Nevada, U.S.A., settled in 1859 when the famous Comstock Lode was discovered. The mines under the city produce large quantities of gold and silver bullion. Pop. (1910) 2244, the decrease due to the lowering of the price of silver.

· l'irginianus). e bird, about g a quail in idge in habits.

of leather and cotton goods, boots | The pulmage is remain brown on the upper parts and yellow beneath. In the United States it is commonly called 'bob-white' from the note of the male bird.

Virginian Stock (Malcomin marifima), a hardy cruciferous plant bearing racemes of white, red, or lifac flowers. Its varieties produce a succession of bloom from early spring to late summer.

Virginia University, Charlotte-ville, Virginia, U.S.A., was founded in 1819 by President Thomas Jefferson, and opened in 1825. It confers the usual degrees by examination after residence. In 1907 the number of students was 776.

Virginia Water, a dist. of Egham, Surrey, 23 m. from London. The lake lies in the S. of Windsor Great Park, and was formed by the Duke of

Cumberland, the victor of Culloden. Virgin Islands, The, are a group of some hundred, belonging to the Lec-ward Is, in the W. Indie. Their total and 18° 50' N. They belong to docent in 1835, and full professor in Denmark, the United States, and 1844. His writings include: Esthetil:, England. Sugar, cotton, maize, oder Wissenschaft des Schönen, 1846-limes, and coffee are cultivated. Road- 57; Kritische Gänyr, 1844-75; and town on Tortola is the chief city Alles und Neues, 1881-89. See Lives (1805) and Correlations of Control 1805. (410 inhabitants). Total pop. (1911) 5562.

Virgin Mary, see MARY, THE VIRGIN. Virgo, the sixth sign of the zodiac, and an ancient constellation. noted for its nebulæ, situated in the head and breast, of which the spiral Messier 99 is the chief. The con-stellation is entered by the sun about Aug. 21. It was usually represented by a woman holding an ear of corn, spica, and was identified in Egypt, probably from Chaldea, with the goddess Ishtar. It marked the Egyptian harvest time. It is also associated to the with Astrea, Demeter, and Persel 1262. phone. Spica is of magnitude 1.2; family y 3.6 is a binary with a period of 180 γ 3.0 Is a binary with a period of 120 years, both variable; ε (Vindemiatine) is of magnitude 3.0; η, another spectroscopic binary, has a period of 72 days. There are thirty stars of magnitudes 4.4 to 5.2.

Viriathus, a leader of the Lusi-nians against the Romans. When tanians against the Romans. When the Carthaginian influence in the Peninsula had finally been overcome by the Romans, the Lusitanians (inhabitants of what is now Portugal) rose under the leadership of V., who was originally a herdsman. For ten years he kept the Romans at bay (151-141 B.C.), but was finally murdered in 140.

Viridian, a pigment composed of hydrated sesquioxide of chromium, produced by decomposing borate of chromium with water. It is a magnificent deep-green colouring agent. not easily acted upon by atmospheric impurities.

Virtues, see CARDINAL VIRTUES. Virues, Christoval de (c. 1550-1619), a Spanish dramatist and epic poet, a native of Valencia, served for many native of various, conversely of the Spanish army. His famous tragedies, 'Ca-sandra,' Marcela,' 'Elisa Dido,' 'Semiramis,' and 'Atila were published (1609) under Furiosa. the title Six Bras Trágicas y Liricas.

Virus, in medicine, the polson of an infectious direase. The term is especially applied to the poisonous substances found in the tissues or

discharges of an infected individual. Viscacha (Lagostomus trichodactulus), a large rodent found on the Pampas of S. America. The body is from 18 to 21 in. long, and the tail 6 to 8 in. The fur is mottled grey above and yellow on the under parts.

Vischer, Friedrich Theodor (1867-87), a German philosophical writer,

by Ziegler, 1893, and Oswald, 1896. Vischer, Peter (1455-1529), a German sculptor, born in Nuremberg. He executed a tomb of Archbishop Ernestin Magdeburg cathedral (1497), of Prince Frederick the Wise at Wit-tenberg (1521), and of St. Sebald at Nuremberg (1508-19). See C. Head-lam, Peter Vischer, 1901. Visconti, the name of a noble Lom-

bard family which for a long time held dominion over Milan. This lordship of Milan was practically established by Ottone, who was appointed to the archbishopric of that town in He drove out the opposing family of the Della Torres, and left his possessions to his nephew. Matteo. The greater part of the 14th century was taken up with constant quarrels with the papacy, and on more than one occasion the V. defeated the papal troops. During the whole of this century the V. were supreme in Milan, and Galeazzo II. was of such importance that he was able to marry his daughter and respectively to the son of Edward III. of Englar French ki

the arts. Pavia, and was a patron of Petrarch. He was succeeded by the joint sovereigns Barnabo and Gian Galeazzo, the latter of whom was the most powerful of all the V. He spent the greater part of the time in fighting against the various towns of Italy, and was finally made Duke of Milan by the Emperor Wenceslaus for a con-ideration. His brother who succeeded him, and who was the last of

the male V. line, died in 1447. Visconti-Venosta, Emilio Marquis (1829-1906), an Italian statesman. He commenced his career as a rabid anti-Austrian and Mazzinist; but later re-nounced Mazzini, although he always remained a strong anti-Austrian. He was associated with Cayour and Garjbaldı, and was by the former made an Under-Secretary of State. He took an important part in the movement for the evacuation of Rome by the French, and was also the Director of Foreign Affairs in Italy during the strenuous days of the France-Prussian War. His policy and his tact raised Italy high in the councils of Europe. He came to an under-tanding with France on the question of its re-lations in Tripoli and Funis and with Austria on the question of Albania and the Adriatic. He was one of the born at Ludwig-burg, and educated greatest of Italian statesmen during at Tübingen, where he became privat- the 19th century.

change of shape, the property de-pending on the rate at which the change takes place. It occurs most markedly in fluids; and is called into play whenever the portions of any liquid or gas, move with fluid, different velocities, the tendency being to destroy any relative motions among the parts of the fluid. Fluids differ greatly in the degree of V.: thus some liquors instantaneously take are poured, e.g. water; while others, e.g. treacle, glycerine, take a little time to do so. The former are said to have a very low V., and the latter a high V. V. is explained by the diffusion of the molecules an various portions of the fluid, cules of the faster-moving diffusing into the slower mo-

tions, and vice versa, thus tending to maintain a common velocity for all portions. V. causes the fall of a mist through the air to be slow, the sub-siding of waves on the sea when the wind falls, and also the lulling of the Toxic influences, such as that of wind itself.

Viscount (from Low Lat. vice-comes, 'in place of earl,' through O. Fr. viscomte), the title of the fourth

degree of no baron, first John Beaum...

the title was given to the deputy sheriff, who acted on behalf of an earl

within his estate.

Viscum, a genus of shrubby parasitic plants (order Loranthanacere). The best-known species is V. album, mistletoe; but several others are sometimes grown, including V. cruciatum, which bears red fruits and

atum, which bears rea trutes and generally grows on the olive.

Vishni-Volotchok, or Vyshnii-Volochok, a tn. in the gov. of Tver, Central Russia, on the Vishni Canal, 230 ditton dependent upon a variety of causes, such as injury, constitutional causes, such as injury, constitutional causes, such as injury constitutional causes.

Viscosity is that property of matter was invented by Alexander Melville whereby it offers a resistance to a Bell (1819-1905), a lecturer in elocu-The alphabetic tion and philology. characters are themselves descriptive diagrams of the shape of the mouth in pronouncing the corresponding sounds, and words thus printed are calculated to suggest the spoken sounds. In this way deaf mutes have been taught to read aloud and to add to their speaking vocabulary. See A. M. Bell: Visible Speech; The Science of Universal Alphabetics, 1867;

transparent media he light passes, or dation or co-ordina-

in the brain may cause impairment of function of part or the whole of the visual centre. Thus a lesion may cause hemianopia, an half-blindness cause file of the state of the or half-blindness, one side of the visual field in each eye being affected. tobacco, are usually responsible for amblyopia, in which the visual impressions are dimmed. Paralysis or inflammation of the optic nerve may cause total or partial blindness. Glaucoma is a condition of doubtful etiology; various visual defects are experienced, which may proceed quickly or gradually to total blind-ness. Inflammation of the transparent media leading to exudations naturally occlude the vision. titis, or inflammation of the cornea, is the result of injury or is secondary to conjunctivitis. Opacity of the lens to the tissues

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whey are observed only in Bengal.

Visible Speech, the name of a retina.

Visible Speech, the name of a retina.

Visions, see Apparations, Spraintenance of symbols representing the position of the organs of speech.

In kind, of the nerve termination.

Visions, see Apparations, Spraintenance of Symbols representing the position of the organs of speech.

e not coa condition of diplopla. wisten avists; this is due to - nerves. ner cent

id a smanct proportion of it is due to some defect, in kind, of the nerve termi-

rents in time of war to stop the private or mercantile vessels carrying the flag of a neutral state and being within the territorial waters (see TER-RITORIAL WATERS JURISDICTION) of the belligerent or his enemy in order to ascertain whether such vessels are in fact neutral. Warships are not the subjects of this right. The right is exercised by sending an officer on board the suspected vessel to examine the register (see MERCHANT Shipping Acr), the log, invoices and charter party, and other ship's papers so as to satisfy himself that both the character of the ship and the nature of her cargo are neutral. The late Hall states that continental Mr. jurists are nearly unanimous in maintaining the exemption from V. and S. of contoyed ships as an established principle of law, but himself thinks the principle to be evidently inadmissible in authoritative international law, as well as inconsistent with the rights of belligerents and disadvantageous in the long run to the neutrals themselves. From the Parliamentary Papers relative to the Declaration of London it seems, however, that the British point of view ever, that the British point of view yielded to the continental doctrine that the 'neutral vessels under national convoy are exempt from search' (see also Declaration of London). Resistance to V. and S. justifies capture. See Hall, International Law, hapter x.

Visitation, Order of the, a religious sisterhood founded in 1610 by St. Francis de Sales. It now follows the

Francis de Sales. It now follows the rule of St. Augustine, but at its for-mation had no special yows.

Mary. Feast of the Blessed Virgin Mary. Feast of the, a festival held in the Western Church on July 2, to commemorate the visit paid by St. Mary to her cousin Elizabeth.

Viso Monte, one of the Cottian Alps, situated in Italy, at the source of the R. Po. Altitude 12,605 ft. Vison, see MINK.

Visp, or Vispach, a tn. in the canton of Valais, Switzerland, about 5 m. W.S.W. of Briz. Pop. about 900.

Visscher, Cornelis (1629-58). Dutch engraver on copper-plate, executed many engravings, chiefly after Guido Reni and Ostade.

Vistula (Ger. Weichsel, Polish Wistula (Ger. Weichsel, Polish Wistula, one of the largest rivs. of Europe, rises in the Beskid Mts. (altitude 3675 ft.) in Austrian Silesia, and flows in a N.W. direction to Schwarzwasser, afterwards passing Cracow, whence it is navigable to its mouth at the Friendes Haff in the Bette. The the Frisches Haff in the Baltic. Its chief tributaries are: on the right, the Drewenz, Ossa, Liebe, and San; and on the left, the Przemsa, Pilica, Brahe, Ferse, and Radaune. Length 652 m.

Vit, Vincenzo de (1811-92), a dis-tinguished classical scholar, a native of Padua, famous for his edition of Forcellini's Lexicon Tolius Lotinilatis (6 vols., 1858-79). He also compiled a treatise on proper names down to the 5th century, entitled Onomasticon, which only reached the letter O, and

works on archæology and philology. Vital Statistics. There are some curiously conflicting facts to be seen in the censuses and registrar-general's reports of Great Britain. It appears that though the birth-rate was down to 1912 steadily on the decline, the death-rate, owing to the constant improvements in sanitation and preventive medicine, has as steadily be-come lower; and it is safe to say that

we, no less than other civilised nations, are gradually becoming a longer-lived people.

Birth-rate of England and Woles.—
The birth-rate of England and Wales reached its highest point on record in Visitor, the officer or superior whose 1876, and its lowest, so far as Eng-duty it is to visit a corporation, civil land is concerned, in 1912. Wales, or ecclesiastical, in order to see that however, reached its highest point in or ecclesiastical, in order to see that its light to prove the court of king's Bench. The which acts through the medium of the court of King's Bench. The bishop is the V. of his diocese; but, on account of the number of parishes, the visitation is usually left to the archdeacous. Vs. are also chosen for religious bodies and communities. Visnea, a genus of evergreen trees; 500,000 in the periods 1881-91 and corder Ternstroeminceæ). The best-known species is V. mocanera, which and the visitation is usually left to the archdeacous whereas the excess above alluded to has varied from 60,000 in the decention of the most known species is V. mocanera, which bears small whitish-green flowers in March followed by berries.

Viso del Alcor, a tn. of Spain, 14 m. bears small winders state.

March followed by berries.

Viso del Alcor, a tn. of Spain, 14 m. this year (1913). In the annual from Seville, with a mineral spring report (1911) the registrar-general called Fuente Lanuda. Pop. about the fertility of married women in pro-

portion to their numbers had been as no other test is available, notwith-high in 1911 as in 1876-80, the standing that the fertility of potential legitimate births would have numbered 1,273,698 instead of the 843,505 factors governing the rate of reproductive to the standard of the sta actually recorded, giving a legitimate duction in a community. The regisbirth-rate of 35.2 instead of 24.4 per tran-general points out that when the thousand of population, as shown in extent to which fertility diminishes the returns. It must, of course, always with advancing age is borne in mind. be borne in mind that the returns are the fall in the proportion of marriages of crude birth-rates, i.e. stated in to marriageable persons, and the eviterms of total population, regardless of the proportion of females of conmust have had an appreciable effect ceptive ages in the population and of in diminishing the birth-rate. This married women. At the same time, will be seen by the following table:—

21011100	Women. At	one bune u	1110,1111	II De ace	m ny ti	ie tonon	ing dible:
Census Year	Proportion per cent. of women aged 15-45 years in the total	Proportion per cent. of married women in the female	Of the married women aged 15-45 years, the proportion per cent, at four groups of ages				Persons married to 1000 marriageable
	population of both sexes and all ages	population	15-20	20-25	25-35	35-45	persons in the population
1871 1881 1891 1901 1911	23·1 23·1 23·8 25·0 24·9	49.6 49.1 47.1 46.8 46.7	1:3 1:1 0:9 0:7 0:5	13.9 13.7 12.8 11.8 9.4	45.5 45.6 46.0 46.8 46.0	39·3 39·6 40·3 40·7 44·1	56.9 51.1 49.8 48.6 46.2

The annual death-rate of Great curous oner chan those above manifestation stood at its lowest point in tioned, measles, diseases of circula-1910, and it was not much higher in 1911, in spite of the abnormal summer heat of that year, or in 1912, and croup, and influenza.

Anart from old age and violence, Table showing the Angual Birth and Death Rates of England and Death Rates of England and The annual

Death-rale of England and Wales .- (genito-urinary system, forms of tuberdeath-rate of Great culosis other than those above men-

lent causes of death in order of severity: Diseases of the nervous system, diarrhœa and enteritis, organic heart disease, phthisis and pulmonary tuberculosis (but if tubercular diseases be taken generally, then the 'white scourge' is easily the most serious cause of death), pneumonia em birth,

II ales for the decennial periods from 1841-1910.

Births per Deaths per Period roon living 1000 living at all ages at all ages 1841—1850 1851—1860 1861—1870 22·4 22·2 32.6 34.4 22.3 35.2 21.1 35.4 1871-1880 1881-1890 32.4 19-1 29.9 18.2 1891-1900 27.0 1901-1910

the Table showing the annual number of Births and Deaths, and the rates of Births and Deaths perthousand of population in England and Water from 1990-1911.

	Births				DEATHS		
YEAR			No.	Per 1000	No.	Per toso	
1900 1901 1902 1903 1904 1905 1906 1907 1908 1909 1910	:		927,062 929,807 940,509 948,271 948,389 929,243 935,081 918,042 940,383 914,472 886,962 881,138	28.7 28.5 28.5 28.5 28.0 27.2 27.2 20.5 26.7 26.8 25.1 24.4	557,830 551,585 535,538 514,628 549,784 520,031 531,281 524,221 520,456 548,003 483,247 527,810	18-2 16-9 16-3 15-5 16-3 15-5 15-1 14-8 13-6 13-5 14-6	

mate births in England and Wales since 1890 has averaged 37,000 annu-ally; from 1875 to 1890 it averaged

42,000; and from 1862 about 45,000. Infant mortality.-It is at least satisfactory to note that although the population (not birth-rate) is still rising, the total death-rate of infants under one year old is either a constant quantity or decreasing. The rate for the September quarter (1913) was equal to 112 per 1000, being 24 per 1000 below the average in the corresponding quarter of the ten preceding years. It is not so much the death of legitimate as of illegitimate children that is the blot on civilisation. It is possible, from the registrargeneral's returns, to state what the proportion of legitimate to illegitimate was prior to 1906, as the returns draw no such distinction prior to that year. It may be stated generally that in England and Wales that of every 1000 legitimate male infants (under one year) born, about 130 die; of every 1000 legitimate female infants, about 110; of every 1000 illegitimate male and female infants born, 250 and 230 respectively. The mortality of illegitimate exceeds that of legitimate infants most of all in the case of deaths attributed to syphilis; it is slight for infectious diseases in general and negative for whooping cough. It is also slight in the case of death from congenital defects, bronchitis, and pneumonia, but heavy for diarrhosa. The principal causes of death in the case of legitimate children are, in order of severity, diarrhosa and enteritis, premature birth, bronchitis and pucumonia, atrophy and debility, convulsions, tuberculous disease, congenital defects, and whooping cough.

Comparative birth-rate of the world.

Roumania appears to have the

highest rate (42 per 1000), after which country follow Jamaica, Ceylon, Chili, Servia, and Hungary (36-40). Austria, Spain, Germany, Italy, Den-mark, and Indeed most of the old countries of Europe follow the above with an average rate of about 26 per 1000. England, as we have seen, is as low as 24, while Scotland, Ireland, and Scandinavia are not much higher. l'rance ingloriously figures at the bottom of the list with the rate of 18. See Daily Mail Year Book, 1914.

Vitalis, Ordericus, see ORDERICUS

VITALIS.

Vitebsk: I. A gov. of Central Rus-a. During the 12th and 13th cen-

In 1912 the birth-rate of England and is undulating and marshy, lakes being Wales was 23.8; of Scotland, 25.9; largeard feature of the physical Ireland, 23.0. The number of illegitistructure. It is fertile; large crops of mate births in England and Wales corn, rye, flax, and potatoes are since 1890 has averaged 37,000 annumber of timber trade is of great importance; and saw mills, flour mills, and paper mills provide employment for a great part of the population. The greater part of the population are White Russians of the Orthodox Church, the remainder being made up of Letts, Poles, and Jews. Pop. 1,502,916. 2. A tn., cap. of gov. of same name, situated on the W. Dwina, about 78 m. N.W. of Smolensk. It is a cathedral town, and boasts many fine churches. As a river port it is fairly important. It importance: and saw mills, flour river port it is fairly important. It manufactures candles, tobacco, and woollen and linen cloth. Pop. about 67,000, of whom a large percentage are Jews.

Vitellius, Aulus (15-69 A.D.), Roman emperor,

of the Augusti, and Nero. He octaine the com-mander of the Roman legions on the lower Rhine; being appointed by Galba, the successor of Nero. In 69 He octable the com-A.D. he was proclaimed emperor by the legions, with whose aid he defeated the supporters of Otho. His gluttony and general ill-living made his reign short, and on the proclama-tion of Vespasian he was captured and murdered in Rome.

Viterbo, a tn. in the prov. of Rome, Italy, about 41 m. N.W. of Rome. It is encircled by old Lombard walls, and contains Etruscan antiquities.

Pop. about 21,300.

Vitet, Ludovic (1802-73), a French vitel, Ludovic (1802-13), a French politician and man of letters. He began by writing art and literary criticisms in *Le Globe;* where he championed the cause of the French Romantics, then beginning to make themselves heard. In 1831 V. was appointed by Guizot to the post of director of historic polymers. director of historic monuments. He was elected as a deputy in 1834. In politics he was a Conservative.

Vitex, a genus of deciduous and evergreen trees and shrubs (order Verbenaceæ) bearing white, lilac, blue, and purple flowers in cymes. P. Agnua-Castus, the tree of chastity, is a native of S. Europe and is half-hardy in Britain.

Viti Islands, see FLII ISLANDS. Vitis, a genus of creeping or climbing shrubs (order Ampelidaceæ) with small fragrant flowers followed by berries. I'. vinifera is the vine (q.v.). A number of species are grown for their ornamental foliage on trellis work, pergolas, and walls; one of the finest is V. coigneties, which has large handsome leaves that are beautifully tinted in autumn. A very hardy turies an independent province, but first is V. coignetice, which has large conquered by the Lithuanians in the handsome leaves that are beautifully tentury. The area of the country is about 17,500 sq. m. The prov. species is I labrusco, fox grape, which: bears heart-shaped purple or yellowish leaves, and has been of great Water-glass (a solution of sodium) value in raising new varieties of may be used with the same result. grape-vines on account of its resistance to Phylloxera.

win 1813. Pop. (1910) 32,377.

Vitre, a to. in the dept. of Ille-etVilaine, France, about 22 m. E. of
Rennes. It is a medieval town with

an old castle. 10,500. Vitrified Forts. Pop. (est.) about

Vitrified Forts. Forts or camps found in many parts of Western Europe and the British Isles; built of stone blocks, many of which seem to have been compacted together by fire. Many theories have been put forward in order to explain the formation. The two chief theories are: (1) that they have been vitrified accidentally; (2) that they are the result of volcanic action. The former theory is substantiated to a certain extent. since the action of camp fires and watch fires may quite easily have caused the solidification. It must be remembered that this vitrifying process is observable only in places, and that much of the stone work that is found in these vitrified forts is loose. The volcanic theory has been practi-cally disproved. The exact period when these forts were creeted cannot be determined; but we have examples which date back to Roman times, if not earlier. See Ferguson, Story if not earlier. See Ferguson, Story of the Irish before the Conquest;

Munro, Prehistoric Scotland, 1899.
Vitrina, or Glass Snail, a genus of
molluses with very thin shells. The
animal is too large to retract its

whole body into the shell.
Vitringa, Campegius (1659-1722), a divine and commentator, born at Lecuwarden, studied at Franccker and Leyden. Was created D.D. (1680), professor of oriental languages (1681). Commentarius in Jesaiam; Velus Venice; from 1714 was in St. Mark's Synagoga; Anacr Commentarius in Venice; from 1714 was in St. Mark's Commentarius in Venice; from 1714 was in St. Mark's tationes Sacræ; Propheticæ, etc.

Vitrol, see Sulphuric Acid, Corperas, White Virriol, etc.

Vitro - Varnish Painting. An practiced in Vivandière. and professor of theology in the university at Franccker (1683). Among

Vitro - Varnish Painting, an art practised in Venice in the 15th cen-tury, but now almost lost. Varnish highly coloured for painting was canteen.

which is to 10 per cent. of burnt-glass powder, the resulting substance being applied with a fine brush (as in gesso-painting) to any surface. When dry the effect pro-Varnish etc.

Vitruvius, or Marcus V. Pollio, Roman architect and writer, military Vitoria, or Vittoria, an episcopal city, cap. of Alava prov., N. Spain, African War (46 B.c.), and inspector dates from 1181. It is the site of to whom he dedicated his De Archivalles of the state of Wellington's victory over the French | tectura (completed about 16-13 n.c.). This work is largely compiled from Greek authorities, and treats of architecture (books i.-vii.), water and aqueducts (book viii.), sundials (book ix.), machines and military engines (book x.).

Vitry-le-François, an arron, and the of Marne dept., N.E. France, 19 in. from Chalons - sur - Marne, at the beginning of the Rhine-Marne Canal, called after its founder, Francis I. (1545). It trades in wine, grain, cement, wood, and iron. Faifene ware is manufactured. Pop. about

8000.

Vitry-sur-Seine, a tn. of Seeaux arron., Seine dept., France, about 2 m. from Paris. It has nursery-gardens of ornamental and fruit

trees. Pop. about 10,000.

Vittoria, a tn. of Treviso prov., Venetia, Italy, 20 m. from Treviso, formed (about 1879) by union of the rival towns Ceneda and Serravalle. Silk and cement are manufactured, and there are saline and sulphur springs. Pop. (est.) about 19,140, (tn.) 2980.

Vittoria, a tn. of Syracuse prov., Sicily, on the Camarino, 14 m. from Modica, founded (1605) and named after Vittoria Colonna. There is trade in wine, soda, and ashes. Pop. (with Scoglitti) about 32,220. Sec also

VITORIA. Vittoria Colonna, see Colonna,

VITTORIA. Vitus, a Roman saint who suffered martyrdom under Diocletian, and whose day is celebrated on June 15. His aid is invoked against St. Vitus's dance (Chorea), hydrophobia, and other complaints.

She is now displaced by the

oils: and Laim or Almse (c. 1446- therapeutics. 1502), a portrait painter.

Vivero, the cap. of Vivero dist. and seaport of Lugo prov., Galicia, N.W. Spain. Flax-weaving, fishing, and coasting-trade are carried on. It is on an estuary in the Bay of Biscay. Pop. about 12.850.

Viverra, see CIVET.
Vives, Juan Luis, more commonly known as Ludoricus Vives (1492-1540), Vives, Juan Luis,

known as Ludoricus Vives (1452-12)
a Spanish echolar and educationist, born at Valencia. He became professor of humanities at Louvain struction—by persons who muse, sees a licence issued by the Home pointed tutor to Princess Mary of England, for whom he wrote De the Anti-Vivisectionist Society. Tatione studii puerilis epistole due Against: Tait, Uselessness of Vivisus (1523). Having opposed Henry VIII.'s divorce, he withdrew to His works include De His works include De Wivisection; S. Paget, Experiments on Animals.

Catherine de, see Ram-Bruges. His works include De Tradendis Disciplinis (see translation by Foster Watson, Vives on Educa-tion, 1913), Linguæ Lalinæ Exer-citatio, 1539; De Causis corruptarum Artium, 1539, and Tudor Schoolboy Life, the Dialogues of Juan Luis Vives (Eng. trans. by Foster Watson, 1908).
Viviani, Vincentio (1622-1703), an

Italian mathematician of a noble Florentine family, pupil of Galilei. He gained a European reputation, he gained a European reputation, being made chief engineer by the Grand-duke Ferdinand, pensioned by Louis XIV., and elected foreign associate in the Académie Royale des Sciences, and Fellow of the Royal

Society of London.

Vivien de Saint-Martin, Louis (1802- a publishing firm in London (1879), 97), a French geographer, born at Caen. He published: Carte Electronic, 1827; Tables Chronologiques novels. See autobiography, Glances and Geographic de France. He trans- back through Seventy Years (1893). and Géographic de France. He trans-lated the works of Sir Walter Scott (1836-39), and was the author of prov., Beira, Histoire de la Révolution Française Oporto. It and Histoire de Napoléon. His two masterpieces are the Nouveau Dic-tionnaire de Glographie universelle, and Allas Universel to illustrate his

(ff. 1450-99), the pupil of Antonello of logical knowledge, e.g. the circula-Messina, who taught him to paint in tion of the blood and the value of This, however. denied by many, who ear nothing has been discovered with the aid of V. that could not have the aid of v. that could not have been discovered without it. So the arguments developed, until in 1876 a royal commission was appointed to investigate the problem. This was followed by an Act which provides inspectors to visit registered

Vizagapatam, the cap. of a dist. of the same name in Madras, India, situated on the E. coast, N. of Dolphin's Nose. The European quarter is in the suburb Waltair. Manganese ore, native cloth, ivory, and rice are exported. Pop. 41,500. In the district of Vizagapatam, rice, sugarcane, tobacco, and cotton are grown.

Area 17,222 sq. m. Pop. 3,000,000.

Vizcaya, or Biscaya, one of the three Basque provs., N.W. Spain, on the Bay of Biscay. It has valuable Society of London.
Vivien, or Viviane, a beautiful deposits of from one.
enchantress of the Arthurian legend, Pop. (1910) 348,684. Cap., Bilbao.
mistress of the famous sorcerer
Vizetelly, Henry (1820-94), an
English publisher and pioneer of the Merlin, over whom she cast her spell, left and the depriving him of his power and imprisoning him in a thicket of thorn. Her palace was in the midst of a margical lake, hence she is sometimes trated Times (1855), and became Paris magical lake, hence the 15 cometimes to the 14ustrate called the 'Lady of the Lake.' See correspondent to the 14ustrate Correspondent Correspondent to the 14ustrate Correspondent Correspondent to the 14ustrate Correspondent Correspond

> Vizeu, or Viseu, the cap. of Vizeu prov., Beira, Portugal, 50 m. from Oporto. It has a 12th century cathedral and remains of the Romain Campo de Viriato near by. There is an annual fair in September. Pop. about 402,260.

Vivisaction, the dissection of, and experiment upon, living animals. V. is an ancient practice, Galen being one of its exponents. It is claimed that by V. alone was it possible to discussional and patholical and physiological and patholical and vivisanagram, or Vizianagram, a fortified tn. of Vizagapatam dist. Madras, British India, 17 m. from Bimlipatam. It has a military cantonnent and the residence of a tamindar.' There are fine buildings, cover much physiological and patholical and visit and vicinity of the control of the

Vizier (Arabic Wazīr), a title first gether for the protection of Russia given to the chief minister of the After his death the importance of

the arron. of Grenoble. In its castle Dauphine deputies assembled (1788) just before the outbreak of the is trade in cattle and corn. Revolution. Pop. 4300.

Vlacq, Adrian, a Dutch mathema-tician of the 17th century, who composed and printed books of logarithms, which had been recently invented. He translated and added to Briggs's Aritl

tables long used on the continent.

Vladikavkaz, the cap. of Terek prov., Ciscaucasia, Russia, on Terek R. and N. slope of the Caucasus, 50 m. from Mozook. It is an important military station with active trade.

Pop. (1910) 76,486.

Almost all th

Vladimir: 1. A gov. of Central Russia, having Moscow on the W. and Nizhni-Novgorod on the E., and containing about 19,000 sq. m. It is situated in the Volga basin, undulating It is situand fairly fertile. Minerals are worked. chiefly alabaster and porcelain clay. Good crops of rye, oats, barley, pota-toes, and flax are raised; and the fruitgrowing industry is increasing rapidly every year. The gov. is industrially of great importance, ranking only after those of St. Petersburg and Flax, cotton, and cloth Moscow. form a large p

Russians and Pop. 1,570,733. 2. A tn., the cap. of the gov. of same name, situated about 100 m. N.E. of Moscow. It is the seat of an archbishop and contains many fine churches. Two of these many fine churches. churches, those of St. Demetrius and of the Nativity, date back to the 12th As a riv. port it is impor-

tant, and has dye works and cotton

mills. Pop. about 32,000.
Vladimir I., Grand Duke of Kief, called also St. Vladimir and Sunny Vladimir (980-1015), a warrior prince of Russia who at the head of a band of Vikings, collected principally in Scandinavia, did much to establish a strong duchy. V. was converted to Christianity and became a member of the Greek Church, thus giving prac-tically national sanction to the reli-gion which is still retained by Russia. In this way he became the 'hero' of the monks. (1052-1125),

carly Russian e was able to

Abhaside caliphs, and since spread the duchy of Kief rapidly lessened, among most Oriental nations.

Vizille, a tn. in the dept. of Isere, hynia gov., S.W. Russia, dating from France, situated on the Romance, in the 9th century. It is 17 m. N.E. of the spot at which the Polish, Russian. and Galician frontiers meet. about 9000.

Vladivostok, the cap, of the prov. of Russian Siberia, and an important naval port on the Pacific. It is the Eastern terminus of the Trans-Siber-He translated and added to ian Railway. It is a garrison town. and the pop. (1906) of 41,862 is made

also produced a metria Artificialis (1633), containing French painter, born at Valencienues. He lived afterwards at Paris, and his death occurred at Rome. There are pictures of his in the Toulouse Museum and the Hermitage at St. Petersburg: but he is remembered chiefly as having been an intimate friend of Watteau, with whom he shared a studio at one time.

Vlissingen, see Flushing. Vodena, or Vodina (ancient Edessa), an archiepiscopal see and tu, of Salovilayet, Rumelia, European

Turkey, 40 m. from Monastir. manufactured. There is trade in red pepper, silk cocoons, and wine. Pop. about 25,000.

Vodka, Russian brandy, the national spirituous drink of Russia, Originally it was distilled from eye, but maize and potato spirit me often used. It contains about 50 per cent, of alcohol, and has such a strong flavour that it does not recommend itself to people other than Russians. The effects of V.-drinking among those who cannot purchase spirit of good quality constitute one of the social

problems of Russia. The sale of V. Is

a government monopoly.
Voothus, or Voot, Gisbert (1388-1676), and his sons, Paul and Daniel, were distinguished members of the University of Utrecht. Gisbert was born at Heusde, studied at Leyden, and took orders, becoming minister of Hensde till 1634. Professor of theology and oriental languages at Utrecht, he advocated the doctrines of the Synod of Dort; and was an ardent controversialist. attacking Descartes, Cocceius, and any non-Calvinist. Paul, born 1619, taught logic, metaphysics, Greek, and civil law at Utrecht, and published juridical and theological works. Daniel, born 1629, was professor of philosophy at Utrecht, and published several textbooks.

Vogel, Sir Julius (1835-99), a jourof most of the nalist, colonial financier, and states; and them to-man, born in Landon. Settled in Victoria in 1851 as a journalist, and Temple de Jérusalem, Mémoires de in 1861 tried his fortunes in New Villars, Le Duc de Bourgogne et le Zealand. He entered the Provincial Duc de Beau-Villiers, and Mélanges Council of Otago in 1862, and in 1866 was at the head of the provincial government. His great life work was to revive the fortunes of New Zealand after the disastrous war between the North and South Islands of 1866-70. He negotiated a loan with England of over £20,000,000, and thereby developed the natural resources of the colony, and attracted a great influx of immigrants. He also rendered valuable services in the New Zealand telegraph and postal arrangements, in railway development, and also in colonial defence. Notwithstanding

colonial defence. Notwithstanding all his zeal and ability he died a poor man. See also Times, March 4, 1899.
Voghera (ancient Iria), a tn. of Pavia prov., Lombardy, N. Italy, 16 m. from Pavia, on the Staffora. Silk, corn, and wine are produced. Pop. about 14,450.
Vogler, Georg Joseph, the Abbé (1749-1814), a German organist and composer, born at Würzburg of musical parents, and early showed an aptical parents, and early showed an aptical parents, and early showed an aptical parents, and early showed an aptitude for music. Studied music and theology and was ordained priest (1773); founded a school at Mannheim, where he met Mozart. Travelled widely (1780-99), probably Travisiting England. Founded schools at Stockholm and Darmstadt. A great extempore organist. Browning made him the subject of a poem (Abt Vogler).

Vogt, Carl (1817-95), a Swiss natuvogt, Carl (1817-95), a SWISS Batti-ralist and biologist, born at Giessen. Studied medicine at Giessen and Berne. Appointed professor of zoo-logy at Giessen (1847). Expelled from Germany for holding Radical views (1848), he became professor of geology at Geneva (1852), which posi-tion he retained till death. Entered the Swiss Parliament, as a Radical the Swiss Parliament as a Radical He was one of the earliest (1878).scientists on the continent to see the importance of Darwin's and Wallace's discoveries, some of which he had made independently. He wrote largely on subjects of biological, zoological, and anthropological interest. For his relation to Darwin see Quatre-

logist and diplomatist, born in Paris. After explorations in Syria and Pales-

d'archéologie.

Vogüé, Eugène Melchior, Vicomte de (1848-1910), a French historian. cousin of above, born at Nice. He wrote for the Revue des Deux Mondes and the Journal des Débats. and the Journal des Débals. From 1888 he was a member of the Academy. Deputy for Ardèche (1893-98). His chief works are Le Roman Russe (Eng. trans. by H. A. Sawyer, 1913), Histoires Orientales, Chez les Pharaons, Histoire et Poésie, Jean d'Agrève, Les Morts qui Parlent, and Le Maître de la Mer.

Vohwinkel, a vil. of Mettmann circle, Düsseldorf gov., Rhenish Prussia, 4 m. from Mettmann. about 9100.

Voice and Voice Training. Voice is

the production of sound by means of the production of sound by means or vocal cords or membranous reeds situated in the larynx. The pitch of a voice varies with the size of the larynx—the smaller the larynx the higher the pitch. There are six distinct types of voice, classified according to timbre (i.e. quality of the product tone) rather than to pitch—(male) bass, baritone, tenor, and (female) contralto, mezzo-soprano, and soprano, the latter approximation to a boy's treble. Middle female voices should really be classified as mezzo-soprano and mezzo-contralto, since they vary considerably. A similar suggestion has been made regarding male voices: but the baritone is, strictly speaking, of bass timbre, although higher in pitch. Most voices have a compass of approximately two octaves, lese commonly of three; but the tone-quality of a voice is not consistent throughout its compass. The upper 'register' (i.e. series of notes of similar quality), or 'head 'voice (roce finla), as opposed to the lower register or 'chest' voice (roce piena), demands a different process of production. In head voice, the pitch is raised by gradually re-laxing and shortening the vocal reeds, in chest voice by increasing both tension and length, the variations in length being in both cases infinitesimal. There is no physiological justiror insrelation to Darwin see Quatrefages de Bréau, Les Emules de Darrin, fleation for the commonly accepted
1894. See also Lives by B. Weber
and A. von Wurzbach.
Vogud, Charles Jean Melchior, The transition from one register to
Marquis de (b. 1829), a French archivolesistation of the voice into three
another must be made without violent logist and diplomatist, born in Paris. change of timbre; the successful After explorations in Syria and Palestine, he became a member of the Aca-everything else in singing, depends demy of Inscriptions (1868). He was principally on correct breathing. demy of Inscriptions (1868). He was principally on correct breathing, ambassador at Constantinople and Especially should a singer refrain later at Madrid, but resigned in 1879. from producing head notes with the The French Academy elected him a chest and tice tersa, and as the member in 1901. Among his works registers overlap to some extent, this are: Les Eglises de la Terre Sainte, Le lis practically unnecessary. In breath-

ing the chest should be raised and the been superseded by Esperanto (q.v.). ing the chest should be raised and the been supersedua by Esperanto (q.r.), abdomen drawn inwards breath being Consult Sprague's The International taken through the chest breath being Consult Sprague's The International taken through the chest breath being Consult Sprague's The International taken through the chest breath being Consult Sprague's The International taken through the chest breath being Consult Sprague's The International taken through the International taken through the chest breath being Consult Sprague's The International taken through the Internationa The possible. , and Harrison.

the passage of air through the vocal cords should be 'placed' or focused on that part of the roof of the mouth which adjoins the upper front row of teeth (i.e. the frontal hard palate). There is the widest divergence of opinion as to the correct poise and shape of lips, etc.; generally speaking, however, unnatural positions and muscular tension should be avoided. See Albert Bach, Principles of Singing; Henderson, Art of the Singer, etc.

Void and Voidable, a void contract or deed is one that has no legal or

adjudged invalid for some flaw.
Voiron, a tn. of Isère dept., France,
on the Morge, 14 m. from Grenoble,
noted for cloth manufs. Silk, paper, straw, tools, and chemicals are also manufactured. It formed part of Sayoy till 1355. Pop. about 12,625.

Voiture, Vincent (1598-1648), French poet and letter-writer, born was a favour-

ins. Richelieu, ide him maitre pensions from D'Avaux, Anne of Austria, Mazarin, and was an original member of the Academy. His poems and vers de société were published after his death, the first edition appearing in 1650. Later editions are those of Ubicini (1855) and Roux (1850), and Letters by Uzanne (1880). See Sainte-Beuve's Causeries du Lundi.

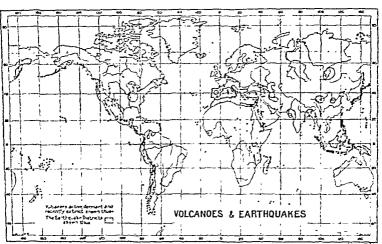
Volans, a southern constellation S. of Argo, formed by Bayer (c. 1603),

γ, ε, ε, are double. Volapük, one of the earliest artificial languages, was invented in 1879 by Johann Martin Schleyer, a pastor of Constance, Buden. The word is coined from world and speak. The vocabulary of V. is borrowed from Latin, the Romance languages, and chiefly from English. It is inflectional, the grammar and syntax being partly borrowed mar and syntax being party contours and partly original. It was taken up by educationists and spread to Paris (c. 1885), and in 1887 was recommended by the London Philocommended by the London Philocommend the London Philocomm

simplification of its forms and given. mar for commercial correspondence, ejected, has been to build up a newer to which suggestion, however, cone and cruter within the broken Schleyer was strongly opposed. Such ring of Monte Somma. Smaller volcissensions prevented V. from becamic comes exist in the Phlexron coming universal, and it has now Fields near Naples, and these, nearly

Volcanoes. A V. is a vent in the earth's crust from which lavas and ashes, etc., are ejected. If the vent is in the form of a fissure it is not commonly called a V. The term V. is generally restricted to those conical mountains which are built up by material ejected from a fissure by means of a central throat or pipe. At means of a central throat or pipe. At the top of the cone is a pit-shaped opening called the 'crater.' An ideal section of a V. would show that the cone was built up of layers of layers and ashes, these layers being built up binding force whatever owing to state peated eruptions. Vs., however, exadical defect. A toidable contract peated eruptions. Vs., however, exadical defect. A toidable contract peated eruptions. Vs., however, exadical defect. A toidable contract peated eruptions. Vs., however, exadical defect. A toidable contract peated eruptions. Vs., however, exadical defect. A toidable contract peated eruptions. Vs., however, exadical defect. A toidable contract peated eruptions. Vs., however, exadical defect. A toidable contract peated eruptions. Vs., however, exadical defect. A toidable contract peated eruptions. Vs., however, exadical defect. A toidable contract peated eruptions. Vs., however, exadical defect. A toidable contract peated eruptions. Vs., however, exadical defect. A toidable contract peated eruptions. Vs., however, exadical defect. A toidable contract peated eruptions. Vs., however, exadical defect. A toidable contract peated eruptions. Vs., however, exadical defect. A toidable contract peated eruptions. Vs., however, exadical defect. A toidable contract peated eruption in the contract peated erupti around the central pipe by oft-re-peated cruptions. Vs., lowever, ex-hibit two great types of cruption: are ejected with explosive violence. while in the latter the lava rises up into the crater and flows over the rim or breaks through the sides. Of the first type we may mention Stromboli. The cone of this V. is built up from the bottom of the Mediterranean sea, and is about a mile high, although little more than half projects above the water. Steam issues constantly from an opening about 1000 ft. from the top. In the floor of the crater are cracks in which lava may be seen in constant ebuilition Fragments of the lava are occasion ally hurled into the air. The bestknown V. is probably Vesuvius, near Naples. Provious to 79 A.D. Vesuvius was only a conical mountain with a deep crater about 3 m. in diameter at the summit. In that year a most destructive explosion occurred, pre-ceded by several violent earthquakes, and the towns of Herenlaneum and Pompeli were buried in the dust which fell. By this explosion a large part of the walls of the crater was blown away; the part left standing constitutes the crescent shaped elevation known to-day as Monte Somma. During the emption A.D. no lava was emitted. this outhurst, Vesuvius has During the cruption of 79 Since had other violent emptions separated by periods of quiescence. As a general rule the longer the period of quiescence, the more explosive is the following cruption. Important cruptions have taken place in 1737, 1794, 1822, 1872, and 1906. The cumulative effect of all these outbursts by which lavas and ashes have been

extinct, discharge only carbon discharge stage is known as the solfataric stage. This stage is known as the solfataric stage. The eruption of Krakatoa, between labove the sea. During an eruption Java and Sumatra, which took place in 1883 after a period of 200 years quiescence, was an eruption of extremely explosive violence. As a tremely explosive violence. As a result of this outburst the whole of the northern and lower part of the island disappeared, and half of the cone of Rakata was blown away. The ashes were projected some 200 m. lictle are considered: (1) Cones built of ash ashes were projected some 200 m. lictle are considered: (2) cones built of lava into the air, and were carried all alone: (3) chains of craters. The first round the world, causing most brilliant sunset effects in many places. Enormous sea waves were caused which travelled half-way round the earth and which did inestimable S.W. and N.E. Enormous floods of damage to the coasts near the island. lava are often emitted from these



The cause of the cruption is attributed to the sudden escape of superlack in 1783, when two streams of
heated steam. In 1902 two cruptions basalt lava with maximum widths of
occurred in the islands of St. Vincent,
15 m. and 7 m. flowed for a distance
and Martinique in the W. Indies,
of 50 m. Eruptions which are strictly
the phenomena being practically the not from Vs. are those described as
same in both cases. The V., La
fissure cruptions. These are lava
Soufrier in St. Vincent, contained
source ruptions and are known in the
sulphurous gases. After premonitory
warnings in the shape of carthquake River plains), in the Deccan plateau
shocks, the crater lake boiled over,
and the next day a huge cloud of
incandescent dust rolled down the
incandescent dust rolled down the
incandescent dust rolled down the
of Mont Pelée, a cloud of incandescent,
lines with comparatively short disdust descended upon the town of St.
lance from the sea, and are usually
Plerre, which was blotted out in a
listance from the sea, and are usually
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Plerre, which was blotted out in a
listance from the sea, and are usually
lines with comparatively short disdust descended upon the Hawaiian face of the earth's crust is steepest.
Islands the volcanic eruptions are of The lines of Vs. are generally parallel

to the shores of the continents, and E., S. (from Samara), and from they form a complete Girdle of Fire, Tsaritsyn S.E. After the Oka (from

thre

Extinct Vs. also occur in many other year, this river is one of the great The agents co regions. causing volcanic eruptions heated waters or their gases. The water is regard

gases. extremely high pressure, and the eruptions are caused by the sudden expansion of large volumes of steam. which escape along lines of weakness. Intimately associated with Vs. are Geysers (a.v.). For reference see Judd's Volcanoes, also works on the subject by Scrope and Daubeny. Scc also Chamberlin's, Salisbury's, and Geikie's Textbooks of Geology. See AGGLOMERATE, BOMB, LAPILLI, etc. Volgi, or Vulci, an ancient Etruscan

city, situated some 55 m. N. of Rome Italy. Its inhabitants were defeated by Coruncanius in 280 B.C. Since 1828 excavations have been made, and in its necropolis Greek bronzes and painted vases have been found.

Vole, a name, probably of modern origin, given to various species of rodents. The water V. or water rat (Arvicola amphibius) is about I ft. long, from nose to tip of tail. Its fur is thick and shining, rich reddish brown above and yellowish grey be-neath. Its feet are not webbed, although it takes readily to water. It feeds chiefly on the stalks of sedges and other aquatic plants, and is of service in helping to keep water courses clear. By some authorities the momen has been sub. ter

sti the rat un Th in

It is acomore losses to crops. great numbers by owls and kestrels.

Volga, The (the Rha of the ancients), published Voyage en Egypte. Elected the longest river (2325 m.), and one of the chief waterways, of Europe. It lies entirely in Russia, and rises in the valdai Hills of Tver, eventually reaching the Caspian Sea at Astra khan by as many as 200 mouths. The main directions from the source are at the Ecole Normale. His most Volga, The (the Rha of the ancients),

they form a complete Girdle of Fire Transish S.E. After the Uka (from round the Pacific Ocean. From the southern extremity of the continent of America, active Vs. extend through the Andes, through Mexico and California to Alesta then through the Andes, through Mexico and California to Alesta then through the Andes of Alesta the Andes of Andes navigable for as many as 20,000 m., whilst the main stream is navigable Care
Pap
and
Sur
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Lind
the Vs. of Iceland, the Azores, and another line is formed by the Vs. of the Mediterranean.

Synt Kare Residue on the Vs. of the Mediterranean.

Synt Rybinsk, Novgorod, and Saratov; whilst Tver, Yaroslav, Kostroma Kazan, and Samara are also on its by the Vs. of the Mediterranean. ice-bound from 90 to 160 days each system Vs. also count in many other ivear, this river is one of the great nmerce for the products nd central Asia as well

of the Russian empire. opened up direct comtained in the molten magma under munication with St. Petersburg, Riga, and Archangel.

Volhynia, a gov. of S.W. Russia, bordering on the Polish governments on the W., Minsk on the N., Kiev on the E., and Galicia on the S. The surface of the country is, on the whole, quite flat, but in the W. the country is given a billy appearance. country is given a hilly appearance by a spur of the Carpathiaus. The government is divided into twelve districts. The pop. is well over 3,500,000, and the peasantry are 3,500,000, perhaps better off here than in any other part of Russia. Its area is roughly 28,000 sq. m. Timber proroughly 28,000 sq. m. Timber provides the chief occupations of the inhabitants, who are principally Little Russiaus.

Volition, see Will.
Volkovysk, a tn. in the gov. of Grodno, 44 m. S.S. E. of Grodno, in Russia. Pop. 10,581.
Volksrust, the centre of an agricultural dist., quite close to the northern boundary of the Transyand, 175 m. S. F. of Johannesburg. Pop. 175 m. S.E. of Johannesburg. (1904) 2382.

(1833-1900), Volion, Antoine French painter. He studied art under Ribot, and, like him, achieved his finest work in the domain of still-life: but he also practised portraiture, and did a few landscapes. There are pictures b and the G

Volney, boul, Con sopher and in Aniou.

Syria (1782-86), and after his return published Voyage en Egypte. Elected member of the National Assembly. Constituent Assembly, and the Convention. He suffered imprisonment.

lations sur les Revolutions des Emnires. 1791. See Sainte-Beuve's Causeries du Lundi, and a monograph by Berger.

Volo. a seaport on the Gulf of Volo. with a museum of antiquities, in Thessaly, Greece. There are thriving industries and commerce. Pop. (1907)

23,563.
Vologda, a gov. and its cap. in N.E. Russia. The gov. stretches for 800 m. from Novgorod to the Urals and has an area of 155,265 sq. m. In the N.E. rise the tallest peaks of the Urals, and in the N. is a swampy plateau comprising the Timan high-lands. From the S.W. flows the Sukhona, from the N.E. the Vychegda, and in the E. the Pechora. A characteristic feature of the landscape are the 'parmas,' or marshy, wooded plateaus. Cereals and flax are cultivated, and the timber trade (especially in firs) is important. Pop. (1911) 1,651,200. The tn. lies on the Vologda, 127 m. N. of Yaroslav by rail. There is considerable commerce in linseed, flax, oats, and dairy produce. Pop. (1904) 32,349.

Volpato, Giovanni (1733-1803), an Italian engrayer, was a pupil of Bartolozzi in Venice and afterwards settled down in Rome, where he engraved the masterpieces of Raphael and Michelangelo in the Vatican and also some paintings of Carracci.

Volpi, Gian Antonio (1686-1766),

an Italian classical scholar and publisher, was professor of philosophy and rhetoric at the university of his native city of Padua. The jointowner of a printing press with Gae-tano, his brother, he brought out excellent editions of Catullus (1737) and Tibullus and Propertius, besides issuing a treatise on Roman satire

(1744).

Volsci, an ancient Italian people of E. Latium, akin to the Oscans and Umbrians, dwelling on both sides of the Liris down to the Tyrrhene Sea. They were at war with the Romans in the 5th and 4th centuries B.C. and often allies of the Æqui, but were subdued (338) and made Roman citizens by 304. Coriolanus defeated them at Corioli (c. 490 B.C.). The Hernic dwelt E., the Aurunci and Samnites to the S. Among their towns were to the S. Among their towns were Antium, Satricum, Arpinum, Norba, and Velitree (Velletri), birthplace of Augustus. See Smith, Dictionary of Augustus, See Smith, Dictio Greek and Roman Geography.

Volsk, a tn. on the Volga, 80 m. N.E. of Saratov, in Russia. There are market gardens. Pop. 27,572

(1900).

founder of which was Volsung, the formed with brilliant success. He now

famous work is Les Ruines, ou Medi-grandson of Odin. See Morris, Story

grandson of Odin. See Morris, Story of Sigurd the Volsung, 1898.
Volt, the practical unit of electromotive force (E.M.F.) in electricity. It was defined by order in council (1894) as having 10³ absolute units in the C.G.S. system; and as being that electrical pressure which, when applied to a conductor whose resistance is 1 ohm, will produce a current of 1 ampère. It is represented by 0.6974 of the pressure between the poles of a Clark cell at 15° C. The voltage of a system simply means the difference of pressure exerted on the system measured in volts.

Volta, Alessandro, Count (1745-1827), an Italian physicist, noted for his discoveries in electricity. He became professor of natural philo-sophy at Pavia University (1774-1804); at Padua (1815), retiring 1819. V. travelled in Switzerland (1777), through Tuscany (1780), in Germany, Holland, and England (1782)—where he met Banks and other distinguished men. He invented the electrophorus (see Rosier, Journal de Physique, 1776; Phil. Trans., 1778), an electrical condenser (1782), and the hydrogen lamp (1777). His most noted discovery was, however, that of the development of electricity in metallic bodies (see *Phil. Trans.*, 1793); re-peated experiments leading to the invention of an electrical battery, and later of the 'Voltaic' (or Galvanic) pile (see Phil. Trans., 90. 1800). A collection of his works was published (1816). See Bianchi and Mochetti, Vila, 1829-32; Volta, A. Volla, 1875.

Volta, Aswada, or Adirri, a riv. of French Sudan and Upper Guinea, W. Africa, between the Niger and the Gambia. The two main upper branches are called the Black V. and the White V. Rising in the Kong Mts., it flows S.E. and S. (c. 900 m.) through the Gold Coast to Adda. There are rapids above Akuse, and a

bar at the mouth.
Voltaic Cell, see Cell, Voltaic. Voltaire, François Marie Jean Arouet de (1694-1778), a sceptic, dramatist, and historian, born in Paris, his father being an official in the Chambre des Comptes; educated at the Jesuit Collège Louis le Grand. At an early age his precocity won him the support of Ninon de l'Enclos; and by the age of eighteen his literary abilities had gained him entrance into the most brilliant intellectual circles. In 1715 he was banished, and on his return in 1717 imprisoned in the Bastille for writing a scurrilous lampoon on the regent. He had Volsungs, a heroic race (prominent already written the tragedy Edipe; in old Germanic and Norse sagas), the and on his release in 1718 it was perfounder

assumed the pseudonym of 'Voltaire.' Works. 32 vols. Moland Ilives by In 1723 the poem on Henri IV., which had been censored in Paris for its anti-popery, was printed at Rouen; the following year, the play Mariame was produced. About this time another court quarrel resulted in further imprisonment until 1726, of decomposition which the current when he was exiled to England, Here, as the protégé of Bolingbroke, he two was welcomed in circles of intellect. Voltarra, an enisconal case of The was welcomed in circles of intellect and became versed in English politics, literature, and philosophy—the Many valuable Roman and Etruscan latter especially stimulating his scepticism. On his return to Paris (1729) he realised a fortune by (1729) he realised a fortune by speculation; and in 1734, threatened with arrest for his Lettres Anglaises (1509-66), an Italian painter, born at Volterra. Studied under Specified Pierino del with arress to the control of the plants of the property of the plants o At Circy he wrote the plays Alzire.

Mérope, and Mahomet; the poetical
satire La Pucelle; Treatise on Metaphysics; a thesis on Sir Isaac Newton: part of Siècle de Louis XIV.; Les Mœurs et l'Esprit des Nations; Zadig, Mours et l'Esprit des Nations; Zadig, measuring electrical pressure in volts, and other eastern tales. Meanwhile, V. had become the intimate correspondent of Frederick the Great. Madame de Châtelet died in 1749, and the following year V. visited Frederick at Berlin. Here he was entertained in great style, his chief the current. Vs. in general use are occupation being to correct his classified as electro-magnetic and hot patron's writings; but a di correct of the current. Vs. in general use are classified as electro-magnetic and hot patron's writings; but a di correct his classified as electro-magnetic and hot patron's The Sidele de Le in 1753. The Siècle de Lo

turn to Paris in 1778. man of brain rather t

l'infâme, he specifically to .. anity, but to sion by any .

The chief manuf. is alabaster. Pop.

Voltmeter. aninstrument measuring electrical pressure in volts. The instrument is connected to the two points between which the pressure is

in 1753. The Siècle de Le

was completed about this time. From
1755 onwards, V. spent his time at
Geneva, beginning his anti-Christian
writings in 1762. Other works of the
period include Candide, the Dietion of the D'Arsonval galvanometer. It consists of a
coil working in jewelled centres and
the working in jewelled centres and
the coil asoft iron cylinder is mounted.
The coil and the cylinder are placed
tionnaire Philosophique, histories of
Peter the Great, of India, and of
Louis XV., the Treatise on Toleration,
and Irêne—the last being performed
with triumphant success on V.'s revertical sent into the coil, electro-magturn to Paris in 1778.

man of brain rather t

tion of the D'Arsonval galvanometer. It consists of a
coil working in jewelled centres and
the voll in solution to be coil to enter the region in
and Irêne—the last being performed
which the coil rotates. When a curvith triumphant success on V.'s rerent is sent into the coil, electro-magmount of rotation being
to not the D'Arsonval galvanometer. It consists of a
coil working in jewelled centres and
the voll as off in private the coil as off in our place.
The coil and the cylinder are placed
to misse the poles of a permanent
horse-shoe magnet, thus centring a
uniform field of force for the region in
and Irêne—the last being performed
with the coil rotates.
When a curwith triumphant success on V.'s rerent is sent into the coil, electro-magmount of rotation being tion of the D'Ar-

to the pressure. er genius— type of instrument can only be used on in many for continuous currents. Another fields and perfection in none. His electro-magnetic type of instrument neign and perfection in none. His recurrent manner cype of instrument poems are cold, his metaphysics is the moving magnet relimeter. This exectable, his dramas weak in construction, his histories biassed and soft iron always tends to move to the inaccurate; but he excels as a strongest parts of a magnetic field. struction, his histories biassed and soli iron always tenus to move to the inaccurate; but he excels as a strict. Although he attacked Christianity, he also attacked the fashionable strength of the field. It the atheism of his time (e.g. Hollach's): strength is produced by a current, the atheism of his famous cry Ecrasse. For this type of instrument and in his famous cry Ecrasse. For this type of instrument a stringted piece of magnetized soft is a fine of the field and the first tenus and the first t .- iron is placed in a field due to a current and the amount of movement is measured. The amount of this

movement is proportional to the in- ated in the menacing position in tensity of the current. This instrument may be used for direct or alternating currents. In the hot wire ward as volunteers to fill the places of type, measurement depends upon the elongation of a wire under the inbe called abroad. fluence of heat. One of the effects of an electric current passing through a wire is to heat it, the elongation thus Scottish humanist who lived in the produced affording a means of measuring the pressure. The great defect of Vs. of this variety is that the university of Paris, where he early pointer does not indicate at once the showed a preference for classical value of the current owing to the fact learning. For a time he was tutor to that the wire takes time to attain its maximum temperature. They may wards occupied a scholastic position be used for continuous or alternating on the continent. He died in 1546 currents. Another type of instru-while on his way to Scotland. His be used for continuous or alternating on the continent. He died in 1546 currents. Another type of instru-, while on his way to Scotland. His ment is the electrostatic V. introduced works, which were written in Latin, by Kelvin. In principle it closely reflect the beauty of his nature no resembles the quadrant electrometer. less than the excellence of his It consists of a pivoted aluminium scholarship. needle, which can oscillate between Volute, in architecture, the rolling two plates which are placed on opportures or 'ears' which form the site sides of it. The needle and the chief beauty and characteristic featived plates are connected to the two lurged the capitals of the Ionic order. points between which the pressure is The name is frequently given to any required. This charges the plates curve of this kind. and needle to different potentials and ; and neede to different potentials and thus causes the needle to move, the causing occlusion of the passage. It amount of movement being proportional to the square of the potential upon itself or by the formation of a difference. The instrument may be loop. It occurs most often in the used for both continuous and alternational figure, and is preceded by a

Voltri, a tn. of Cenoa prov., guria, N. Italy, 9 m. from Genoa, Liguria, N. Italy, 9 m. 170m orano, on the Gulf of Genoa. Paper, iron, on the duli of denoa. Taker, non, woollen and cotton goods are manufactured. Shipbuilding is carried on. The Austrians here defeated the French under Masséna (1800). Pop.

about 14,820.

SPECIFIC Volumenometer. 850 GRAVITY.

Volumetric Analysis, see ANALYSIS,

CHEMICAL. separation of church and state. They would abolish all endowments and state grants for religious purposes, thus making the support of the ministry and all church activities dependent on voluntary contribu-

Volunteers (Naval and Military), the name which was formerly applied to the troops that enlisted voluntarily for service at home. They tarily for service at home. They the central nervous system is con-have since been superseded by a certed; in cases of stomach irritation, territorial force (q.r.). The old bismuth, ice, carbolic acid, or creo-volunteers attended a certain number, sote should be administered. of drills until they became efficient. The territorial force, however, which consists of a complete army, the stomach due to ulceration; small is a great step in advance of the clots of blood being mixed with the previous system. The force origin-

Volvulus, a twisting of the intestine ting currents. Another important period of constipation. The sympfeature is that no current gets through toms are severe localised pain, absothe instrument and thus no power is lute constipation, and distension of wasted.

Surgical interference is the only treatment possible,

Vomer, a thin bone situated vertically between the cavities of the nose. It forms the posterior part of

the nasal septum.

Vomiting, a reflex act by which the contents of the stomach are violently ejected through the cardiac orifice. up through the esophagus, and out of the mouth. It is caused by the presence of irritating substances in the stomach, and under such circum-Voluntaryism, the system advo-stances is a protective effort of the cated by those who desire the entire organism. It may, however, be produced by a variety of different causes: by certain drugs; by diseases such as peritonitis, gastric ulcer, constipation, kidney disease, liver disease, consumption, etc.; by certain visual. olfactory, or other sensations; or by reflex nervous stimuli, as in the 'morning sickness' of pregnancy, which originates in the pelvic region Opium and morphia are useful when the central nervous system is con-

Vondel, Joost Van Den (1587-1679). a Dutch poet, the son of Anabaptist refugee parents. Holland, settlin They returned to settling in Amsterdam 1600). V. joined the Roman Catholic Church (1640). His dramas (mainly tragedies) include: Hie salem Verwast, 1620; Palamedes. Hieru-1625; Gijsbreght van Æmstel, 1637; Lucifer, 1654 (perhaps used by Milton for Paradise Lost): Samson: 1660: and translations from the classics.

Voodooism, a primitive form of fetish-worship supposed to have been brought from Africa into America and the W. Indies by the negro slaves when they were imported. It consists in the worship of a certain serpent, and the terrible nature of the rites has been much exaggerated. The derivation of the name Voodoo

is unknown. Voragine, Jacobus de (c. 1230-92), an Italian author and cleric. He wrote a voluminous history of Genoa, whose archbishop he was for several

m. Bav steir by r E.

Breg Vorde, a vil. of Schwelm circle, Westphalia, Prussia, 8 m. from Barmen. Manufs. include iron and steel goods and wood screws. Pop. about

-6600. Voronezh, a gov. and its cap. in S. Russia. The gov., which has an area of 25,443 sq. m., is watered by the Don and its tributaries, has uplands in the W. and E. of the Don. as well as low, level, and sometimes sandy stretches, and rejoices in a fertile soil, though forest lands are sparse. Besides all kinds of cereals, sunflower, besides all kinds of cereals, sufficient tobacco, aniseed, and beetroot are grown and exported, and there are rich pastures adapted for cattle breeding. Pop. 19113.121,000. The trail S.S.E. of Mo.LOW. It would be the commerce on the Don. which brings down wood, tallow, hides, and flax down wood, tallow, hides, and flax, Pop. (1910) 79,000 besides cercals.

(decreasing). Vörösmartz, Michael, sec Hungary

Literature. Vorsterman, Lucas (c. 1595-1675), a ne etudied art in

Arundel.

turned to Flanders, and there did a number of memorable plates for Van Dyck's Iconography, 1645. Sec Hind.

Short History of Engraving, 1908.
Vorsterman, Lucas (c. 1628-75), a Flemish engraver. A son of the above named, he lived chiefly at Antwerp, and engraved the illustrations to the Duke of Newcastle's book on horsemanship, 1657; but he is remembered rather by his fine prints in Theitre des Peintures de Teniers, 1660.

Vortex, a term used in hydro-dynamics for a motion in a fluid in which the individual particles are conceived as having a circular or rotatory motion. In hydrodynamics a distinction is drawn between such a motion and one in which there is no 11

of motion in a non-viscous or perfect fluid. He stated that irrotational motion always remains as irrotational years; but he is chiefly remombored by his Legenda Aurea, better known as The Golden Legend (g.v.).

Vorarlberg, the westernmost dist. of Austria-Hungary, forming with Tyrol a prov. of Austria, 11,312 sq. straight line vector perpendicular to the control of the

ine of rotation, and of length tional to the vorticity. It can wn that such a line or filament start or end in the interior of id, and that a vortex always s of the same elements of liquid.

Kelvin adopted this idea in his vortex theory of matter, conceiving matter as vortices motion in the all-per-vading ether.

Vortigern, a British chief, who after the departure of the Romans chief, who became head of the British tribe-(c. 425 A.D.). Harassed by the Piets and Scots, he called in the Saxons to his aid and so led to his country's conquest by them.

Vos, Cornelis de (the Elder) (c. 1585-1651), a Flemish painter, pupil of Remeeus and friend of Van Dyck. His best works were portraits, and he also produced historical pictures. He was Master of the Guild of St. Luke at Antwerp (1608), and dean (1619-20). The Antwerp Museum contains his portrait of Abraham Graphens (1620).

Vos, Marton (Martin) de (the Elder), 1531-1603), a Flemish painter, son (c. 1531-1603), a Flemish painter, son of Pieter (d. c. 1566), pupil of Floris and Tintoretto, painting landscapes in some of the latter's pictures. He went to Rome and Venice, returning to Antwerp (1559), and becoming dean of the Guild of St. Luke (1572). nd about He painted portraits, historical and where he religious works, and landscapes, the Earl Many where he religious works, and landscapes, the Earl Many examples are in Antwerp Subsequently he re- Museum.

m. in area) in eastern France, shut in eastward by the V. Mts., the highest French peak being Hohneck (4482 ft.). The Moselle and Meuse have the largest drainage areas. Oats, wheat, and also the vine are cultivated; and cheese-making, besides cattle-grazing, is important. Large forest tracts account for the wood-working industries, but textile goods are the first manuf. Epinal (also the chief town) and St. Dié are two of the five arrondissements. Pop. (1911) 433,914.
Vosges Mountains (Lat. Vogesus),

are a range of mountains along the W. bank of the Rhine, closely resembling in many respects the Black Forest along the E. They stretch for 150 m. from Basel to Mainz, running between the departments of vosges and Meurthe in N.E. France and German Lorraine on the one hand, and Alsace on the other. The Ballon de Guebwiller is the culminat-

ing point (4680 ft.).

Vosmaer, Carel (1826-88), a Dutch journalist and art-critic, born at the Hague. He commenced his literary career as a poet, but turned to art-criticism, producing masterly studies of Rembrandt (1869) and Franz Hals (1874). Edited the Nederlandsche Spekiator; published (1873) Londinias, a burlesque poem on London, published (1873) Lonwith his own illustrations: translated Homer into Dutch (1878-88); and in 1861 wrote an able work on Contemporaru Arlists. There is no satisfac-

tory life. Voss, Johann Heinrich (1751-1826). a German poet, translator, and philo-logist. Invited to Göttingen by the editor Boie (1772); he studied with Heyne for a time, and became a leading member of the 'Hainbund,' a literary society. V. was appointed rector of Ottendorf public school (1778), taught at Eutin (1782), and Jena (1802), and became professor at Heidelberg (1805). His works include Heidelberg (1800).

Idylls, 1802; Inisc, 1795 (v. 1802).

Goethe's Hermann (which Dorolhea): and excellent translations of the classics, including Homer's Odyssey, 1781, and Iliad, 1793, Virgil, 1799, Horace, 1806, Theocritus, 1808, and Aristophanes, 1821. His Sämtliche Werke were published 1853 (new ed. 1879). See Paulus, Lebenskunden... 1869: Briefe (ed. by his son), 1829-33; Herbst, J. H. Voss, 1872-76; Knoegel, Voss' Luise... 1904; Leben by Schmid (1835), Döring (1834), Goerres (1826); Sauer, Der Göltinger Dichterbund, i., 1887.
Vossius, or Voss, Gerhard Johann (Gerard Jan), (1577-1619), a Dutch school (1600), and of the theological Dorothea): and excellent translations

school (1600), and of the theological school (1601), and of the theological

Vosges, a frontier dept. (2303 sq. | professor of eloquence there (c.1622). He visited England (1629), and became a prebendary of Canterbury through Land's influence. On his return to Holland he was made professor of history in Amsterdam University (1631). His works include: Aristarchus, sive de Arte Dramatica: Histarchus. sive de Arte Dramatica: Historia Pelasgiana, 1618; and Ars Rhetorica, 1623. They were published, 1695-1701. See Tollins, Oratio 1649; V. André, Bibl. Belgica; Toll. De Vossio perfecto grammatico, 1778. Vossius, Isaac (1618-89), a Dutch philologist. son of Gerhard. He

travelled in France and Italy, and was in Sweden (1648-58), invited by Oneen Christina. 'V. settled in England (1670), and was made a canon of Windsor by Charles II. (1673). works include: De septuaginta interworks include. De sepuagina incr-prelibus corumque translatione et chronologia, 1661-63; De Poematum Cantu . . . 1673; Variarum Observa-tionum Liber, 1685; De Sibyllinis . . Oraculis; and editions of the classics. See Foppens, Bibl. Belgica; Niceron, Mémoires, xiii.; De Crane, De Vossiorum Juniorumque familia, 1820.

Vostitza, also called Aigion, a seaport of Achaia and Elis, in Greece, on the Corinthian Gulf. It has often been iniured by earthquakes (1817, 1861.

and 1888).

Votkinsk, a tn. in the gov. of Vyatka, Russia, 8 m. W. of Kama. It manufs. vehicles, agricultural imple-

ments, and knitted goods.
Vouet, Simon (1590-1649), a French hi-torical painter. He introduced the academic taste into France, and was considered founder of the French school of painting, proving a successful rival of Poussin, who visited France (1640). V. accompanied the French ambassador to Constantinople (1611), and went to Italy (1612), studying the works of Paul Veronese at Venice and of Caravaggio and Guido at Rome. Louis XIII. recalled him to France (1627) as his principal painter, and gave him work in the Luxembourg, Louvre, and St. Ger-Richelieu also emmain palaces. ployed him at the Château de Rueil. Le Sueur, Le Brun, Mignard, and Dufresnoy were among his pupils.

Vowels, see ALPHABET, PHONETICS.
Voysey, Charles (1828-1912), a
founder of the Theistic church, born
in London, and took holy orders in the Church of England. He occupied a number of curacies, and his views became increasingly more unorthodox. In 1863 he was compelled to leave St. Mark's, Whitechapel, because he denied the reality of eternal punish-ment. He passed to Woolwich and then to Healaugh in Yorkshire. On account of his teaching here he was school at Leyden (1614), becoming summarily deprived of his living and

founded the church of which he reposervations, and the existence is mained the head until his death, discredited.

Among his works are: The Sling and Vulcan, the Roman god of fire, the Stone, 1872-93; Theism, o

Religion of Common Sense. Religion for All Mankind, 1903 Vratsa (Vratza), the cap. of Vratsa dept., Bulgaria, on the N. slope of the W. Balkans, 40 m. from Sofia. Seat Vulpecular, s

W. Balkans, 40 m. from Sofia. Seat Wulpscular, a small constellation in of an archbishop and headquarters of a military division; it produces wine, silk, gold and silver filigree, jewellery, is a variable with a period of 4 days, silk, gold and silver filigree, jewellery, and leather. Pop. about 15,000 (dist. 312,460).

Vrede, the cap. of Vrede div. of Orange Free State (N.E. frontier), S. Africa, about 200 m. from Bloem-Africa, about 200 m. fontein. Pop. about 500.

Founded

Society station, and capital Bechuanaland, which was annexed to the Cape of Good Hope (1895). Pop. about 5130.

Vryheid (Dutch 'freedom'), a tn. of N. Natal, S.E. Africa, 133 m. from Pietermaritzburg. It is the cap. of Vryheid dist.; rich in coal(at Hlobane), copper, gold, and other minerals. Once part of Zululand, it was ceded to the Boers under Meyer, proclaimed an independent 'New Republic' (1884), incorporated with the Transvaal (1888), and annexed to Natal (1903). Pop. about 2290.

(1903). Pop. about 22vu.
Vrynwy, a river (35 m. long), chiefly
in Montgomeryshire, Wales. Rising
in the Berrn Mts. it reaches the
Severn at Melverley after a northenster

ervoir. Lake :

Vukovar, a tn. of Croatia-Slavonia, Hungary, on the Danube, cap. of Szerem (Syrmia) co., 24 m. from

Szerem (Syrmia) co., 24 m. from Eszek. Chief industries: vine culture, milling, distilling, fisheries, and silk culture. Pop. about 10,000.

Vulcan. In 1858 Leverrier surgested that perturbations of Mercury's orbit unaccounted for were caused by an unknown planet revolving nearer the sun. M. Lessarbault wrote stating that he had observed the transit of such a body that same year. Leverrier was satisthat same year. Leverrier was satisfied of the bona fides and apparatus of the observer, and calculated the elements; a transit expected in 1860 dr. and confirm this. In 1862 Mr.

. tson and Mr. Switt, American vers products, paper, and corn. during the total eclipse of July 29, (1911) 44.114.

1878, claimed to have found it, but Vyshnii-Volochok, see no discovery has resulted from any | Volorchok.

see India-Rubber-

Vulcano, sec Lipari Islands.

101 hrs., its magnitude changing from 5.5 to 6.5. It contains the dumb-bell

nebula, Messier 27.

Vulture, a bird with a strong booked beak, and repulsive in appearance and habits, but of considerable value on account of its food being mainly composed of carrion, which it discovers by its abnormally keen senses Missionary of sight and smell. Vs. cannot, like capital of eagles, carry food with their feet and annexed to claws, but feed their young by resues. Pop. | gurgitating from the crop as piecess do. They are classified in two families, the Vulturide and the Cathartide. The former include the griffon V. (Gups fulrus) which occasionally reaches Britain, the black V. (Vullure monachus), and the Egyptian V. (Neophron peronopterus). Among the Cathartides are some peronopterus). birds of great size and powerful flight: examples are the condor (Sarrothe black V.

the Turkey

Vulturnus (modern l'olturno), a riv. in Campania, Italy, near the mouth of which once stood the city of Vulturnum. Rising in the Apennines, it flows to the Mediterranean Sea.

Vyatka, a gov. and its cap. in N.E. Russia. The gov., which has an area of 59,329 sq. m., is an undulating plateau, some 1000 ft. above the sca. The Kama runs in and out of this province; but it is chiefly drained by the Vyatka and its tributaries, in-cluding the Votka and Ish, near which from ore is found. The highwhich from ore is found. The high-road to Siberia crosses Vyatka; it is fed by a single railway, namely, that passing from Archangel to Perm. It is above all a corn-growing country, but pony and cattle breeding and wood cutting are thriving industries. Over half the surface is forest, and 44 per cent. the peasants own into peasants own 44 per cent. Featories are increasing in number. Pop (1911) 3,806.800 The tn. Hes on the Vyatka, 280 m. N.E. of Nizhni Novgorod, of which it is a colony 11 is a cathedral city. Candies and silver and copper wares are manufactured; commerce is largely in wax, animal

VISHNE

ility

ing the functions both of consonant (as in work, wit) and vowel (as in law, few, and Welsh names like Bettws-y-Coed and Braich-y-pwll). Probably the Latin v or u (as consonants) and the Greek digamma F resembled our modern w. It represents a double V (or U), X. The Anglo-Saxon alpha-(or U), X. The Anglo-Saxon alphabet (from 9th century) had a distinct character, p, the present mode of writing W dating from the 13th century. The French use ou as a substitute or Gu for proper names (Guillanme for William). The Spanish use mostly hu (Huanneo, Huelva), but sometimes gu (Guatemala, Guadiana). educated people substitute w for v and vice versa (weal for yeal, vine for wine, etc.). See Willis in Cambr. Phil. Trans., iii. 231; Key's Alphabet. Waagen, Gustav Friedrich (1794-1868), a German writer, born at

Hamburg. He studied at Breslau and Heidelberg universities, and eventually established his home in Munich. In 1830 he became director of the picture gallery of the museum at Berlin, and in 1844 became a professor at the university in that city. His chief works are: Ueber Huberl und Johann van Eyck, 1822; Kunstwerke und Künstler in England und Paris. 1837-59; and Kuntsicerke und Künstler

R. It has from works and raintoau boll. It is a university cuty, and masshops, and manufs. paper. Pop. factory products, chiefly from cotton (1910) 8687. 2. A trib. of the Ohio R. seed. Pop. (1910) 26,425. rising in Ohio, and flowing through Madai, a state of 150,000 sq. m. in Indiana, eventually forming the boundary between Indiana and since 1909, has formed part of French Illinois. It is navigable as far as Equatorial Africa. The capital is

Canal. Length about 550 m.

Wace, Robert, an Anglo-Norman Wadding, Luke (1588-1657), an poet of the 12th century. He was the author of a number of lives of saints, but his two most important works and Scriptores Ordinis Minorum, are his historical poems, the Roman of Brut and the Roman de Rou. W. on the Franciscan brotherhood. Himself all the former the Geste des Brestores (History of the Britons), but his is now always known as the Roman of Brut. It is a reproduction in verse and Brut. It is a reproduction in verse in the French octosyllabic couplet of French statesman, born of English Geoffrey's Historia. The Roman de parents at St. Remy-sur-l'Avre in

W, the twenty-third letter of the it in 1160 at the request of Henry II.; English alphabet, sometimes called a but Henry afterwards appointed anconsonantal u, capable of perform-other poet to write it, and so W. left his work incomplete.

Wacht am Rhein (' Watch on the Rhine'), a German patriotic song, written when France threatened the 1. b. of the Rhine (1840). The words were by Max Schneckenburger (1819-49), and in 1854 were set to music by Carl Wilhelm (1815-75).

Wachter, John George (1673-1757), German philologist and archæologist, acquired an exceptional mastery over classical, oriental, modern languages, a mastery which accounts for the excellence of his Glossarium Germanicum (1736-37), which, like his treatise on numismatics, entitled Archaeologia Numaria (1740) was published at Leipzig, where he was director and librarian of th Museum of Antio tities.

th Museum of Antionities. Wachter, Karl Geor von 1880), a German jurist born at Marbach. He became professor at Tübingen (1819-33 and again in 1836) and at Leipzig (1833-36 and again in 1852). He was president of the Chambers (1839-51). Among publications are: Lehrbuch des romischs deutschen Strufrechts, 1825; Gemeine-Recht Deutschlands, 1844; Beiträge zur Deutschen Geschichte, 1845; Pandekten, 1880; and Deutsches Strafrecht, 1881. See Life by his son, 1881. Waco (so-called from the Waco or

in Deutschlund, 1843-45.

Wabash: 1. The cap. of Wabash
co., Indiana, U.S.A., about 42 m.
S.W. of Fort Wayne, on the Wabash Brazos, 186 m. by rail N.W. of House.
R. It has iron works and railroad ton. It is a university city, and has

Ullinois. It is navigable as far as Equatorial Africa. The capital is Covington, and is connected with Abeshr, which exports ivory and Lake Eric by the Wabash and Eric ostrich feathers. Pop., chiefly Mabas Canal. Length about 550 m. (negroes) and Arabs, about 2,500,000. (negroes) and Arabs, about 2,500,000.

Geoffrey's Historia. The Roman de parents at St. Remy-sur-l'Avre in Rou 14 a chronicle history of the France. He naturalised himself as a Dukes of Normandy. W. commenced French subject in 1849. He was a

member of the National Assembly in have also the engravings he executed 1873, and in 1877 he held a position after his 'Market Sellers' and

Wadebridge, a vil. in Cornwall, England, at the head of the estuary of the Camel, here crossed by a 15th century bridge. Pop. (1911) 2339.

Wadelai, a station, 43 m. N.N.W. of Albert Nyanza on the Upper Nile, in " Er · till Štį

ical , to the central western shore of Lake Zürich, in Zürich, Switzerland, Pop. 9030.

Wadham College, Oxford, was founded in 1612 by Nicholas Wad-ham of Merifield, in Somersetshire, for a warden, fifteen fellows, fifteen scholars, two chaplains, and two clerks. It was built upon the site of an ancient house of the Augustinian friars, and from this college the Royal
Society had its origin, and held its
sittings from 1652-59 in the great hem, on the Rhine in Gelderland,
room over the gateway. In 1913 the Holland. In 1912 the state agriculfriars, and from this college the Royal | number of members on its books tural college was removed to Gröninwas 422.

Wadhwan, a tn., manufacturing soan, saddlery, and cotton, 60 m. W.S.W. of Ahmadabad, in Kathiawar, Bombay, India. Pop. 16,223.
Wadi, or Wady, an Arabic word startistics of

signifying t ravine, or v the Greek or it is also of '

names of places, c.g., Waar-Musa, in Arabia. In Spain, where most of the rivers bear names given by the Arabs, wad has been transformed into guad, e.g. Wadi-1-abyadh has become Guadalaviar.

Wading-birds, see GRALLEL, plon Wadstena, see VADSTENA. Uho Wady Halfa, includes a British camp (founded in 1884), a civil cantonment, and a native village on the Walk includes the property of the work of the w

was the thriving capital of the: Nabatwans. It lies some 60 m. N.N.E. of the head of the Gulf of Akabah in

Western Arabia.

in the cabinet as Minister of Foreign Slaves, etc.

Affairs. For ten years he was the French ambassador in London (1883-93).

Wadebridge, a vil. in Cornwall, The Ws. used in the Eucharist service was the Manual Control of the Eucharist service of of the Roman Catholic Church are thin discs of unleavened bread, stamped with a sacred symbol. Coloured dises of gummed paper are used to designate seals, and are called waters as being substitutes for the thin cakes of wax which used to perform that office.

Wafflard, Alexis Jacques Mario (1787-1824), a French dramatist, born at Versailles. In collaboration with Beranger he wrote the vaudo-ville Les Caméléons, 1815. He also wrote: Haydn ou Le Mennet de banf, 1812; Le Voile d'Angleterre ou La Retendeuse à la Toilette. 1814; Une Pro-menade à Saint Cloud, 1817; Un Moment d'Imprudence, 1819; Un Jeu de Bourse, 1821; Le l'oyage à Dieppe Deux Menel l'Homme

Pop. 9599.

Wager, Sir Charles (1666-1713), a British admiral, achieved his most noteworthy exploit in 1708, when, with a detachment of four men-of-war, he assailed seventeen Spanish galleons off Cartagena and managed to rescue some of the treasure before it sank to the bottom of the sea. For nine years (1733-42) he was first lord of the admiralty.

Wager of Battle, in ancient times a legal process by which the tenant in a writt of right of land offered to prove his right by challenging, or *waging* balle vicariously through his 'champion' with th the latter's

though legally survived till 1818, in which year it was demanded by the nearest Nile, just within the northern frontier relative of a murdered girl against one of the Anglo-Egyptian Sudan. Pop. Abraham Thornton, her supposed of cantonment about 3000.

Wady Musa, the modern name for able but lawful demand led to tapetra, which till the 1st century A.D., formal abolition by Act of Parliament was the thriving capital of the a year later

year later Wager of Law, the name by which the mode of proof by computation continued to be employed occasion-Western Arabia.

Wael, or Waal, Cornelius de (1594-1663). Flemish painter and engravers of the son and pupil of Jan gravers with each and pupil of Jan de W. To of his life was passed in Genoa, his state chief patrons being of witnesses called computation number of witnesses called computation several to wear to the good character and credibility of the accu-ed, and the number of Spaint. No paint verve, and we of computators deemed essential to on the social position of such witnesses; the oath of a thane, for instance, had the weight of that of six ceorls; but the oath of a priest re-

qu' abour, or that given in expa 3 given in exchange for labour. The ultimate source of W. as of profits (q.v.) is the value of that which capital and labour jointly produce, but in practice W. are paid in the first instance out of capital, which, in itself, is one of the agents of production (see Wealtril). That part of wealth which is expended in W. is commonly called by economists the wages fund, an expression which is now generally na expression which is now generally understood to mean no more than that in every industry the wagescapital must be in a certain ratio to the rest of the capital; but, as formulated by Mill, the wages-fund theory regarded general W. as being determined by the 'ratio of capital to population'; a theory which has been the subject of much controversy. Prof. Sidgwick rejects the theory mainly on the ground that it leaves out of account the efficiency of labour though he admits that Mill himself was careful to point out that the wages-fund was made up mainly of wages-fund was made up mainly of circulating capital, and that, as a theory, it was inadequate to determine the rate of W. It is clear, as indicated above, that W. cannot be regarded as ultimately paid out of capital; and that the remuneration of labour is really the share of produce that the remains after paying for duce that remains after paying for the use of capital and land. Competition as between the employers themselves tends to raise W., as between labourers, to lower them. In this respect, however, it is necessary to take into account the modification of the extreme results of unchecked competition effected by (1) trade unions (see TRADE UNIONS), and (2) Minimum Wage Acts. Under the Coal Mines (Minimum Wage) Act, 1912, district boards are set up to settle the rate of W. in different coal areas, and the effect generally of such Acts as this, and of the Minimum Wage Regulations under the Trade Boards Act, 1909, has been that many workmen or labourers have obtained increased rates. among different employments causes that produce different rates of W. are stated by Adam Smith to be (1) The agreeableness or otherwise of the nature of the employment; (2) The difficulty or otherwise, and the expense or cheapness involved in

establish any state of facts depended | man, and (5) The chances of success in the given trade. (On the influence of protection on wages, see under PROTECTION and TARIFF; and on the connection between W. and prices, see under PRICE.) In 1908-9 W. were depressed, but thereafter began to rise, the most marked increase being in 1912; which upward ten-dency has been steadily maintained in 1913. Consult on this Mr. F. H. MacLeod's Report on Changes in Rates of Wages and Hours of Labour in the United Kingdom for 1912.

Wagga-Wagga, a tn., 266 m. N.E. of Melbourne, on the Murrumbidgee, in Wynyard co., New South Wales, Australia. It is the centre of a sheepfarming and gold-mining district. Pop. 6419.

Wagner, Rudoll (1805-64), a German physiologist, horn at Bayreuth. After studying at Paris under Cuvier, he became prosector and ultimately professor of zoology and comparative Erlangen (1832-40). anatomy at whence he moved to Göttingen. His publications include Handwörterbuch der Physiologie (1842-53) and Neu-

rologische Untersuchungen (1853-54). Wagner, Wilhelm Richard (1813-83), a great German dramatic composer, born at Leipzig. From his earliest childhood he was surrounded by theatrical and musical associations. During his school days at Dresden and Leipzig his favourite studies were the classics, ancient history, and the old tales of mythology which he was afterwards to use to such good pur-pose. The hearing of one of Becthoven's symphonies fired him with the ambition to become a great composer, and he placed himself under Theodor Weinlig, cantor at the Thomaschule, with whom he studied composition. Mozart and Beethoven were his idols in those days. His first symphony was produced in 1833 at Leipzig, and in the following year he became conductor of the opera at Magdeburg. By that time he had already composed two operas. Die Feen (the Fairies) and Das Liebesverbut (Love's Interdict). In 1836 he married Wilhelmina Planer, an actress at Königsberg, whither he had gone in search of employment. From Königsberg he went to Riga where he was made musical director at the new theatre. In 1839 he went to Paris with his unfinished opera Rienzi, a work which scarcely foreshadows that breaking-away from established traditions which was the most notable feature of his later productions, but which was nevertheless a remarkable achievement for a young man of twenty-six. It was produced with great success at Dresden in 1842, and apprenticeship; (3) The constancy twenty-six. It was produced with of employment; (4) The degree of great success at Dresden in 1842, and trust necessarily reposed in the work- was followed by Der Fliegende Höl-

lander (The Flying Dutchman), which | saints. did not meet with the same approval, though it has since taken precedence monial law. The influence of the of the earlier work in public favour. movement is widespread through of the earlier work in public favour. Two years later, in 1845, Tannhäuser proved a failure, only Schumann In 1848 he

th touches the music; but W., who had

olitical agitation of the time, was forced to quit where he remained till 1859. Der Ring des Nibelungen, his great tetralogy, was begun before he left Dresden. but ere he completed it he turned aside to write Trislan und Isolde. In In 1861 he received a pardon and returned to Germany. Tristan was produced in 1865, and Die Meistersinger, a comic opera, in 1868. first wife having died in 1865, married Cosima, daughter of Liszt, in 1870. His ideas were adopted by Ludwig, King of Bavaria, who in-vited him to Munich to complete the every possible way. Six years later the entire Ring was performed at Bayrenth, in a building specially being to confiscate the purpose. His last work, Parsifal, was a drama foundation on the stern of work, Parsifal, was a drama founded on the story of the Holy Grail. W. die last least failure and was buried dic ' . his house in

r has ever ne r has ever been the subject of more discussion than W., none has been more hotly attacked or more hotly defended. He was, in trite phrase, a 'man with a mission,' the Carlyle of music and the drama, whose passionate love of truth and beauty, and zealous enthusiasm for the reform of art, led him sometimes into strange paths, where he was with difficulty followed during his lifetime. See his autoliography, My Life, 1911; and Life by Charles A. Lidgey (Master Musician Series): H. S. Chamberlain (Eng. trans. by G. Ainslie Hight): Ernest Newman, 1913; Professor F. Corder; and G. B. Shaw's Perfect Wagnerite.

vil. near Wagram, \mathbf{a} Vienna. Austria. Historically it is important as being the site of the battle of Wagram (July, 1809), in which Napoleon defeated the Austrians

under the Archduke Charles. Wał

which Mohar. The movement which he 1787). started was essentially a reforming one and aimed at re-establishing the Koran as the sole rule of faith. While disowning tradition, he also en-deavoured to abolish popular re-ligious ceremonies and the excessive men who carried mu-leal instru-

He insisted on the most rigorous observance of the cere-Arabia, Africa, India, and the Mohammedan East generally, and it has led to many fanatical revolts.

Wahsatch Mountains, a long range running N. and S. through the centre of Utah, U.S.A. They form the casof Utah, U.S.A. They form the castern margin of the Great Basin and contain at least four peaks over 11,000 tt. high. The lottlest is Timpanogos Peak (11.957 ft.).

Wai, a sacred city of the Hindus, the resort of multitudes of pilgrims, on the Kistna, in Satara, Bombay, India. Pop. 14,000.

Waiblingen, a tn. with manufs. of silk goods, and potteries, 9 m. N.E. of Stuttgart, in Würtemberg, Germany, It is the centre of a vinegrowing district. Pop. 6977.

Waits, goods found, the ownership of which is unknown. Originally applied exclusively to goods abandoned by a thief to avoid arrest. quently if the owner made fresh pursuit and brought him to justice within a year and a day the W. was restored to him. But the goods of foreign merchants were not We., as they were not supposed to know English law.

Waikato, the chief river (200 m. long) of North Island, New Zealand. Rising to the S. of Lake Taupo, which it drains; it flows N.N.W. and finally W. to Port Waikato on the W.

Coast, where it enters the Pacific.
Wainewright, Thomas Griffiths
(1794-1852), an English Journalist. artist, and poisoner, born at Chiswick, He was brought up by his grand-father. Dr. Ralph Griffiths (1720-1803), founder of the Monthly Review. Entering on a journalistic career, he the contributed to Blackwood's. London Magazine, under the p-cudonym of Janus Weathercock, etc., and became a friend of Charles Lamb. He also exhibited in the Royal Academy (1821 25) and wrote art-criticisms. To procure money to pay debts, he polsoned his sister-in-law, mother-inand law, uncle, and a friend, and in 1837 .I was arrested on a charge of forgery and transported for life.

n 131 m. r school in

veneration of the prophet and the ments. The term, however, came to

be applied to musicians who had not the seat of a bishop since 1888, when watch duties, and now signifies the All Saints was made the cathedral bands of street musicians who play Many stirring events in English hisbands of street musicians who play at Christmas time. They date from very early times; in Exeter from

1400.

Waitz, Georg (1813-86), a German historian, born at Flensburg, Schles-wig, and educated at Kiel and Berlin. He was for a short time a member of manufs. the national parliament at Frankfort, trentle slope rising from the R. Calder, and was a keen supporter of the proposed union of the German states into one empire. His national zeal of M ddlesex co., Massachusetts, into one empire. His national zeal U.S.A., including several manufacturing villages. It was originally founding of a school to study mediatival German literature.

Waitz, Theodor (1821-64), a German philosopher, was professor at the University of Marburg. Psychology at Nottingham, and became a curate in Liverpool; but being unable to was the subject to which he gave accept the doctrines of the church of the national parliament at Frankfort,

was the subject to which he gave most of his attention. He also undertook researches lasting over a number of years into the question of the habits and anthropological origins of various uncivilised races, the result of which he embodied in his work Anthropologie der Naturvolker (1859-

Waitzen, the German name for

Vacz (q.v.).

Waiver, in law, the abstaining voluntarily from availing oneself of a right or claim. Formerly also applied to the legal process by which a woman was waived or put out of the protection of the law for any crime for which a man might be outlawed. Commercially W. denotes the oral or written discharge by the holder of a bill of exchange of any party from his liability on the instrument.

Wakamatsu, a tn. of Honshiu, Japan, 60 m. S.E. of Nügata, and chiefly engaged in the manuf. of

lacquer ware. Pop. 40,000.

an ancient observance by which the chief towns are Middelburg body of a dead person was watched Flushing, all night by friends and relatives. Walche and have now entirely died out.

Wake, William, D.D. (1657-1737), an archbishop of Canterbury, was educated at Oxford. He made great educated at Oxford. He made great efforts to unite the English and French Calechism, 1699, and Sermons.

tory have occurred here, for instance, the battle of Wakefield in 1460. The soil around is rich and productive, and the town has a handsome and commodious corn exchange. are also extensive woollen and hosiery W. is well situated on a gentle slope rising from the R. Calder.

accept the doctrines of the church of England entered as a tutor, first at Academy and Warrington wards at Hackney Unitarian College. In 1799 he was confined in Dorchester Gaol on account of a denunciatory letter written to the bishop of Llandaff, but was released in 1801. He has written many tracts, but his bestworks are: Silva Critica, 1789-95. and an edition of Lucretius, 1796. Wakefield Mystery, see Towneley

MYSTERIES

Wake-Robin, another name

cuckoo-pint. See ARUM.

Wakkerstroom, or Wesselstroom, the cap. of the dist. of Wakkerstroom, S. Africa, trades chiefly in wool, skins, and butter.

Wakley, Thomas, founder of the

Lancet (q.v.).

Walajapet, a tn. in the Arcot div., Madras, India, about 19 m. E. of Vellore. The chief occupation of the people is dycing and silk-weaving. Pop. about 10,000.

Makayama, a scaport tn. on the Malata, a tn. and oasis in the mainland of Japan, about 50 m. S.W. Sahara, situated about 255 m. W.N.W. of Osaka. The chief article of trade of Timbuktu.

Wake (Old Eng. tracu, a watch); of Zeeland, Holland, situated beor Lych-wake (Old Eng. lyc, a body), tween the E. and W. Scheldt. The chief token are Middelburg and

Walcheren Expedition, The (1809). Ws. were also observed on the eves of an attempt made by Britain during saints' days. These all-night vigils the Napoleonic War to seize Antwerp were the cause of revelry and disorder, and so came into bad odour, and have now entirely died out.

Strucken the navel forces. The only Strachan the naval forces. The only achievement was the landing of the soldiers on the Island of Walcheren. where thousands died of fever.

Walckenaer, Charles Athanase, Baron (1771-1852), a French scholar churches, while among his literary Baron (1771-1852), a French scholar works are: The Principles of the and geographer, served first in the Christian Religion Explained in a army. His chief works are: Essai sur Brief Commentary on the Church l'Histoire de l'Espèce Humaine, 1798; Faunc Parisienne: Insectes, 1802; Wakefield: 1. A parl. bor. in the Eurres de la Fontaine, 1822: Lettres W. Riding of Yorkshire, has been sur les Contes des Fées, 1826.

Wald: 1. A tn. in the district of sist the reactionary policy of the Dusseldorf, Rhenish Prussia, 7 m. Nationalists and the religious orders. S.W. of Elberfeld. Chief manufs. iron and steel. Pop. 25,311. 2. A vil. in the canton of Zürich, Switzerland.

Pop. 7318.

Waldeek, or Waldeek-Pyrmont, a principality of Germany and a state of the empire, consisting of W. enclosed by the Prussian provinces of Westphalia and Hesse-Nassau, and After becoming a candidate for the Danish throne he narrowly sole king in 1157, and together with Absalon ruled the country firmly and which were periods of great danger to him, and after becoming a candidate for the Danish throne he narrowly sole king in 1157, and together with Waldemar II. (1170-1241), King of Denmark, succeeded his brother, and Emmer. The surface is hilly shown himself a determined upholder forcest. Acriculture and eathle-rearing of Pushish independence in the Danish in throne he narrowly sole king in 1157, and together with Absalon ruled the country firmly and which were periods of great danger to him, and after becoming a candidate for the Danish throne he narrowly sole king in 1157, and together with Absalon ruled the country firmly and which were periods of great danger to him, and after becoming a candidate for the Danish throne he narrowly sole king in 1157, and together with Absalon ruled the country firmly and which were periods of great danger to him, and after becoming a candidate for the Danish information. He became the Danish information in the Danish information forest. Agriculture and cattle-rearing are the chief industries, and iron

61,723.
Waldeck-Rousseau, Pierre-Marie-René (1846-1904), a French lawyer Nantes, son of

eat lawyer and

Gambetta.' studies he the provinci rennes. Became mayor of santes (1870). In 1879 entered politics as By 1360 practically all the old Danish a deputy for Rennes, retaining his membership for that division for nearly ten years. He attached himself to the Republican party, and throughout his career fought strenn-throughout his career fought strenn-through through the fought strenn-through through the fought strenn-through through the fought strenn-through through Rennes. throughout his career rough exten-ously against the reactionary ten-dencies of the reactionary ten-the became the reactionary ten-the became the reactionary ten-the remark. The chief manufs, are porcelain, firebricks, and ware. Pop. 16, 133. Valdenses, or Vaudois, a remark-

of Gambett

tion. Though still deputy for Rennes, from time immemorial separate from he did not take an active part in the Church of Rome. The W. have politics again until 1887, when he became senator for the department sectarian appellation, and have of the Loire. In the Boulanger content we distinctly be distincted by the content of the Loire. In the Boulanger con-troversy he displayed his wonted vigour, but earned the animosity of on ntite But it was

yfus affair, or disintegrating W.-R. into such called upon in ' onbet to form a

cabinet, and in this, in spite of his obvious reluctance, he eventually succeeded, ranging in his cabinet many notabilities of diverse opinions Upper Palatinate, Havaria, 33 m. whose one bond of union was, never-theless, the principle resolve to re-timines. Pop. 5041.

Waldemar I. (1131-82). King of Denmark, surnamed the Great. the posthumous son of Canute Lavard. His childhood and youth

shown himself a determined upholder of Danish independence. He obtained possession of Lübeck and two worked at various points, which, with ind by treaty and friendsup with timber, wool, poultry, and live stock, form the chief exports. The chief tained all the Wend lands and the town is Arolsen. Area 433 sq. m. Pop. 61,723.

61,723.

Pousseau, Pierre-Mariethomia. Livonia, and Prussia, and

regarded in his Denmark, born at a period when the regarded in his Denmark, born at a period when the personality in fortunes of Denmark were at their the death of lowestebb. W. was elected king at the his age of 20. His aim was to obtain at possession of those territories which and had formerly belonged to the Danish Became mayor of Nantes crown and which were now scattered.

people, who form a communion latter he retained that once under separate from the Church of Rome, Jules Ferry. In 1886 he attached and who live in three high valleys of himself to the Paris bar, and at once Piedmont. This little community setablished himself in a leading posi-remarkable for having kept lited. to the primitive faith. The persecutions of the W. fill up a large portion of their history.
Waldheim, a tn. of Saxony, estuated

33 m. S.E. of Leipzig; engaged in the manuf, of cloth and clgars. Pop.

Waldkirch, a in, in the valley of the Black Forest, Baden, 84 m. N.E. of Feiburg; engaged in the manuf, of cotton and woollen goods. Pop. 5425.

Waldsassen, a market to, in the

Waldseemüller (or Waltzemüller), princes, Llywelyn ab Seisillt and his Martin (1470-1513), a German geographer, who styled himself Hylacomylus, born at Freiburg, and became professor of geography at St. Griffith (1039-63) was a monarch of Dié (1504). His fame now chiefly rests on his having suggested in his Cosmographic Introductio (1507) that the New World should be called America.

after Amerigo Vespucci.
Wales. See England and Wales. History.-The aboriginal inhabitants of Britain belonged to an obscure non-Aryan race; but these were in the 6th or 7th century B.C. conquered and assimilated by the Goidequered and assimilated by the Golde-lie Celts, the direct ancestors of the modern Welsh. The Celts attained a considerable degree of civilisation under Roman rule, and accepted Christianity in about A.D. 200, and they maintained this faith when the rest of the island was re-paganised. On the conquest of Britain by the Saxons (c. 450-600) the Celts were driven back into the western corners of the island—Cumberland, W., and Cornwall. Henceforth W. became the main stronghold of the Celts or Britons. Powerful native princes arese in W., and extended and consolidated their dominions. Among the most notable of these were Cadwallon the Long-Handed and his son Maelgwn Gwynedd. The Welsh people were for a time united under the latter's grandson, also named Cadwallon. About this period monasticism made great progress in Wales, and the country began to be organised on tribal lines. The Britons of W. tribal lines. The Britons of W. made for some centuries repeated attempts to recover the N. parts of England from the Saxons; but these 77), who successfully resisted the onslaughts of the Danes, but was himself defeated and slain by the Moreines. On the death his desth his

Saxons from Gwynedd, conquered S. Wales, consolidated his dominions, and made war against England, which he three times invaded. Eventually Harold of England subdued S. Wales and defeated Griffith, who was slain by treachery (1063). The Norman by treachery (1063). The Norman conquest of England (1066) had at first little immediate effect upon Wales, distracted as she was by civil feuds. But it was not long before the Norman kings began to make encroachments, in particular placing on the Welsh borders a number of powerful barons who took advantage of the disorganised state of W. to expand their territories. The next two centuries (roughly, 1066-1282) form an epoch of continual struggle against Norman aggression. There were perpetual revolts on the part of Welsh princes and chieftains, and in 1091 there was a brief and transient Welsh revival, led by Cadwgan ab Bleddyn, who united the Welsh people against the Normans. He met with considerable success for a time, but could not for long stem the torrent of Anglo-Norman aggrandisement. At length Henry I. made a determined effort Henry 1. made a determined enterto anglicise W., which he attacked simultaneously with three armies, reducing most of the Welsh princes to submission. They recovered much of their lost ground, however, during the civil wars of Stephen's reign. His successor, Henry II., determined at once to curb the nower of the border attempts ceased after 664, and there barons and to subjugate the Welsh follows a period of internal strife and princes. He succeeded in establish-Saxon aggression, W. being again ing some semblance of order, largely divided among a number of petty through the instrumentality of Rhys princes. The country was once again ab Griffith (1132-97), a distinguished united under Rhodri the Great (814- warrior and statesman, who became warrior and statesman, who became his ally and vassal, constantly attended his councils, and was made by him justiciar of S. Wales. Meanwhile. Mercians. On his death his dominibefore the end of the 12th century, ions were again divided. The next the Welsh Church had been merged important Welsh prince was Howel completely in the Church of England, Dda or Howel the Good (909-50), and had lost all independence in in-who made himself master of the ternal affairs, Welsh bishops being greater part of W., but did homage consecrated by English archbishops to King Athelstan of England. He who claimed their allegiance. A for-also collected and codified an elabo-imidable stand was made for indeasso collected and codilled an elabori inidable stand was made for indereate system of laws by which the pendence in ecclesiastical matters by people were divided into the royal the celebrated Giraldus Cambrensis class, the free tribesmen, and the (1147-1223), but without ultimate non-tribesmen. From 950-1010 no success. The most important Welsh prince of the early 13th century was vero constant struggles between Llywelyn Fawr (fi. 1194-1240), whose various petty local princes, as well as policy included the alliance of all the many raids on the part of Danes and Welsh princes under his own leaders. Saxons. This period of anarchy was ship, the maintenance of friendship followed by the rule of two strong with the border families, and the

was inspired and led by the famous Llywelyn ab Griffith (1254-82), who was goaded into revolt by the violence of the English king's agents and by the substitution of English law for Welsh custom. He refused to take the oath of fealty or do homage to Edward I., who in consequence in-vaded W. (1277) and compelled Lly-welyn to submit to the humiliating terms of the Treaty of Conway. He accordingly did homage to Edward at Westminster in 1278, but a few years later again broke out into revolt, being acter again proke out into revoit, being exasperated by the establishment of new institutions and the exactions of the English officials. Edward once again invaded W. and completely over-ran the country; Llywelyn was defeated and slain (1282), and his brother David was hanged and quartered. From this moment Wales ceases to have any separate political ceases to have any separate political The most formidable rising against the new order was the tains. great national movement associated sults of these risings and of the havoc wrought by the Wars of the Roses were the complete destruction of the

were the complete destruction of the feedal system, the enormous prevalence of robbers, the appropriation by might have died soon, but for the Englishmen of all positions of trust, the enactment of many severe and mijust laws against the Welsh, and language, with the result that the Bible was translated into Welsh in 62. That saved the native tonene some generations, but by the the century it was clearly become in point of time with the golden age bubly by this day be tying with its of Welsh poetry. At length, in 1536, the Act of Union was passed by which two sounded and the saved the analyse of the dead languages. The revival was conducted in Welsh, and gave better the act of Union was passed by which the species to England. The liberties as well as the laws of England extended to the Principality, and extended to the Principality, and

acknowledgment of vassalage to the king of England. But Llywelyn's movement: it was not till the begin-dream of unity and concord died with him, and the dependence on England was in the highest degree distasteful real religious awakening. The ferto his immediate successors, of whom the most notable was David (1240-46), spread over W. with lightning rapidity who for some time successfully related to the aggressions of Henry III. Its force. The religious revival led the final struggle for independence indirectly to a great though gradual was inspired and led by the famous national awakening which has sized national awakening which has since borne diverse and abundant fruit in forme diverse and abundant trut in the social, literary, and industrial revival now in full progress. During the past century W. has gained enor-mously both in national prosperity and intellectual fruitfulness; and in recent days she has contributed to the service of the empire a large num-ber of illustrious citizens and statesmen, among whom it will suffice to record the names of Lord Aberdare, Sir Hugh Owen, Mr. Tom Ellis, and Mr. David Lloyd George.

Welsh language and literature .-Two causes have kept the Welsh language alive up to the present day, the isolation of the people among the mountains, and religion. The Snow-donian region (Eryri) has never been conquered by England, nor has there been any incentive for any other people save the Welsh to take possession of the Carnaryonshire mountains. There the Welsh language has been spoken since the dawn of great national movement associated has been spoken since the dawn of with the name of Owen Glyndwr British history. Up to the Tudor (fl. 1400-15), the celebrated warrior period it was spoken by the upper and and statesman. The principal results of these risings and of the have princes were patrons of Weish poets, wrought by the Wars of the Roses there are at least two of the old princes. themselves who wrote mediaval verse

up in the wake

extended to the Principality, and was now for the first time given liamentary representation. On the liamentary representation of the liamentary and secondary schools, customs time the popular branches at the Welsh Unibegins to versity colleges. The publication of the limit part of Protessor John Morris take in the various activities of Eng. Jones Welsh Grammar in June 1913, land. In matters of religion W. was will be looked upon as an epoch in the not at first very greatly affected by progress of the new national spirit

Wales

the spelling, to re-introduce some of the strong and beautiful words of mediæval Welsh, to abolish the Latinisms introduced by the scholarly translators of the Bible, and to revert to the standard of pure Welsh prose as it was written by Elis Wyn in his Bardd Cwsg of 1703. Their efforts are meeting with success, and the vernacular press has made a distinct advance in the purity of its vocabulary and in the l use of indigenous idioms in the course of the years 1909-13. The Brython newspaper has taken the lead in this popular movement. Their are eight outstanding names in the roll of Outstanding names in the foll of Welsh letters: four poets, Dafydd ap Gwilym, Goronwy Owen, Islwyn, and Ceiriog; and four prose writers, the author of the Mabinogion, Elis Wyn, Theophilus Evans, and Morgan Llwyd. Dafydd ap Gwilym lived in the 14th century and as nure poet. the 14th century, and as a pure poet in the style of Keats, he is probably the best poet of W. He wrote many Cywyddau or lyrical odes, in which Nature is painted with brilliant touches, and have gained for him the title of The Poctof the Leaves. Dafydd was a troubadour, and ranks close to Vogelweide and Ventadorn in European literature. Goronwy Owen was a writer of the 18th century. studied in the schools. Islwyn is a 19th century blank verse writer, who, though he had very little conception of his art, wrote passages of great vigour and fervour. His influence was strong on the cisteddfod poetry of the 'nineties. Ceiriog is the people's poet of the time of Islwyn. His muse was lyrical, and his songs are to W. what those of Burns are to Scotland. The Mabinogion are of European reputation, and hold an important place in the story of the Arthurian legend. The quality of the style of the Mabinogion has been justly praised by Mat-thew Arnold, while Lady Charlotte Guest has done them much justice in as the model for all generations to copy. The 15th century divides this literature into two. The early period begins with the war peetry of the 5th and 6th centuries, among which the Gododdin is supreme as an early epical song. Then follows the court poets of Four. Then follows the court poets of birth Duke of Cornwall, and on the Norman period, chief of whom is succeeding to the throne the duchy Prince Howel, whose long lyric of W. vests in his eldest son; but the king

of W. The desire of the modern and nature and love is strangely scholars is to bring uniformity into modern in its artistry and places him At this time high in the list of poets. the Mabinogion were recited and written down. The period culminates in Dafydd ap Gwilym. In the 15th century the nobility leave the peasants to their own devices, and Welsh song is heard only in the woods and on the roadside. This leads to the on the roadside. This leads to the popular song of the 16th century as shown in Vicar Pritchard's use of it to help on religion, which develops in the first part of the 18th century into the perfected hymn of Pantycelyn. Then follows the day of the Eistedd-fod culminating in Islwyn and Ceiriog. Letters play a great share in the modern national revival, and in the persons of Professor Morris Jones, Gwynn Jones, W. J. Gruffydd, and Robert Parry, the muse once more is appearing with the freshness she showed in Ap Gwilym. The year 1913 is marked by a striking development in Wyche dropes. Welsh drama, over in hundred companies performing in the

villages. Wales, Calvinistic Methodist Church in, is Calvinistic in its doctrine and Presbyterian in its organisation. is modern in its origin, and owes its Vogelweide and volume volume vas pean literature. Goronwy Owen was a purist of the 18th century. He had a high conception of poetry, was not a 'popular' poet, and wrote a classic ode To the Judgment Day. He is now Welsh Methodists, ccased before Welsh Methodists, ccased before the first General Synod was beginnings chiefly to the preaching of Its first General Synod was 1811. The body has two colleges (at Bala and 1750. Its first held in 1811. training Trevecca), and number some 16,500 members.

Wales, Edward Albert Christian George Andrew Patrick David, Prince of (b. 1894), heir-apparent to the crown, born at White Lodge, Sheen. He was created Prince of Wales on his sixteenth birthday, and, before attaining his majority, in 1912 he had completed his naval education at Dartmouth, Osborne and gazetted midshipman in 1911. went into residence as a commoner Guest has done them much justice in her beautiful English translation. Elis of Magdalen, Oxford, in Oct. 1912. Wyn is the best writer of Welsh prose, and though his master-book, The Sleeping Bard, is borrowed in idea from the Spanish of Quevedo, it is, from the Spanish of Quevedo, it is, nevertheless, so native in its colour, revertheless, so native in its colour, speech, and idiom that it is set to-day saxony, and Prince of Saxe-Coburg as the model for all generations to and Gotha, and is a Knight of the control of the state of the saxony and prince of Saxe-Coburg and Gotha, and is a Knight of the Garter (created 1911).

Wales, New South, see New South

Wales, Prince of. The eldest son of England, becomes at

can, if and when he chooses, create his in 1647 published his Mystery of the son P. of W. and Earl of Chester by Two Juntos against parliamentary letters patent. It is now customary misrule. He was prisoner in the always to make the heir apparent to the throne P. of W., but the title is not heritable. The life of the P. of W. and the chastity of his wife are protected by the Statute of Treasons (see TREASON). Provision is made for the Prince and Princess of Wales by the Civil List Act, 1901. Apart from restrictions as to his nearriage and his protection by the law of treason, the status of the P. of W. is to a great extent that of an ordinary subject. e.g. he may sue and be sued in the ordinary manner, though in such case he is always represented by the Attorney General of the Duchy of Cornwall. The custody and education of the P. of W.

Aberystwith, Bangor, and Cardiff. These three still remain the constituent colleges of the university, none taking precedence of the others. associated There theological are colleges at Bala, Brecon, Aberyst-with, Carmarthen, Cardiff, and Carmarthen, Bangor. Theuniversity grants degrees in arts, medicine, law, music, and

science.

Wales, William (1734-98), an English mathematician and astronomer, was sent, about 1770, to Hudson's Bay to observe the transit of Venus. One of his chief works is Astronomical Observations made on the Voyages for making Discoveries in the Southern Hemisphere, 1788.

Walfish Bay (Walvisch, or Walwich), a bay on the W. coast of Africa and a div. belonging to Great Britain and forming part of Cape of Good Hope. It consists of a stretch of sand and a small peninsula, the area being about 430 sq. m. Pop. 1000.

Walgett, a tn. in the co. of Baradino, New South Wales, on the Namoi R., about 330 m. N.N.W. of Sydney, Pop. 3000.
Walhalla, a tn. in Victoria, Australia, 85 m. E.S.E. of Melbourne.

Pop. 3000.

Walhalla, see VALHALLA.
Walker, a tn. in the co. of Northumberland, England, 3 m. E. of Newcastle, on the R. Tyne. Manufs.

chemicals and has iron foundries and

chemicals and has iron foundries and shipbuilding. Pop. (1911) 13,500.

Walker, Glement (d. 1651), a Presbyterian leader, born at Cliffe in Dorset. He became a student of the Middle Temple in 1611, and on the outbreak of the Civil War chose the parliamentary side. In 1640 he was elected member for Wells and vigorously opposed the independents, and

Two Juntos against parliamentary misrule. He was prisoner in the Tower of London (1649) till his death on account of his History of Independency, part i., 1648; part ii., 1649; part iii., 1651.

Walker, Francis Amasa (1840-97), American soldier and political economist, born in Boston, Massa-chusetts. He became secretary of state for Massachusetts (1851-53): representative of Congress (1862-G3); professor of political economy Tale (1873-81), and president of the Massachusetts Institute of Technology. His c Wages Questi

Land and its .

The Bimetallism, 1896, etc. Walker, Frederick (1840-75), custody and education of the reigning are in the control of the reigning sovereign.

Wales, University of, was founded in 1893 from a union of the colleges of About 1858 he took up carraing and control of the colleges of About 1858 he took up carraing and control of the colleges of About 1858 he took up carraing and control of the colleges of About 1858 he took up carraing and control of the colleges of About 1858 he took up carraing and control of the colleges of About 1858 he took up carraing and control of the reigning are in the the re apprenticed himself to Whimper. From this he became known as an illustrator. He illustrated some of Thackeray's work.

Walker, John (1674-1747), an ecclesiastical historian, born in Exeter and became rector of St. Mary Major, Exeter, in 1698. He published An Attempt towards Recovering an Ac-count of

the Olava

an Ox-"t Winze. He ge and in 1819. Curious

zine: Oxoniana; Letters is rillen by Eminent Persons; Curia Oxoniensis. Walker, John (c. 1781-1859), the in-ventor of lucifer matches, born at

Stockton-on-Tees. He was at first articled to a surgeon, but, disliking the work, took up the study of chemistry, and set up in business in 1818. Ho was especially interested in searching for a means of obtaining fire easily, and after various experiments, invented the friction match (1827).

Walker, Thomas (1784-1836), a magistrate and author, educated at Trinity College, Cambridge. He published a journal called The Original, in which he wrote during its brief

ter in California. W.'s first military his own formulation of the law that exploit occurred in 1853 when he got together an expedition whose object time and in the same locality as a was to capture the state of Sonora in Mexico. He proclaimed himself pre-wrote immediately to Darwin, who sident of the Pacific Republic, but received the letter on June 18, 1858. after a while he was compelled to sur-render to the U.S. military autho-rities. His next adventure was with the Nicaraguans. His interference in Nicaragua. As the result of various insurrections against his rule, W. was deposed from his presidency and taken to New Orleans by the U.S. authorities. After several other intrigues and episodes with various S. American states, he was tried by court-martial and shot in Honduras.

Walker, William Sidney (1795-1846), a Shakespearean critic, was a native of Pembroke. He wrote Shakespeare's Versification (1852) and a Critical Examination of the Text of Shakespeare, with Remarks on his Language and that of his Contempo-raries, together with Notes on his Plays and Poems, 1857. See his Poctical Remains (1852) with memoir by

Moultrie.

Walkerburn, a vil. in Peeblesshire, Scotland, on the Tweed, engaged in the woollen manufacture. Pop. (1911) 1100.

Walking, see ATHLETICS.

Walking-sticks. The habit of using a stick either for support, or show, is of great antiquity, and in modern times the preparation and supply of W. constitutes a large branch of trade in European countries. In 1878 the term W. was applied to candidates in the House of Commons, who tions.

Darwin noted the extraordinary coincidence of views, and communicated with Sir C. Lyell and Sir Joseph Hooker the same day. As a result a in Nicaraguan politics involved him joint paper was read, containing in trouble with Costa Rica. One or Darwin's views, to the Linnean two inconclusive battles were fought, Society on July 1, 1858. W.'s Conbut W. remained in supreme authority tributions to the Theory of Natural in Nicaragua. As the result of various Selection appeared in 1871, and constituted in the selection in the selection appeared in 1871, and constituted in the selection appeared in 1871, and constitute in the selection appeared in 1871, tained his views on the whole question of evolution, differing in certain aspects from Darwin. These points are clearly set forth in Darwinism, published in 1889. In particular he insists on a 'spiritual' influence in man's development, marking clearly a departure from the realm of pure science. This tendency was exaggerated to a regrettable extent in his excursions into spiritualistic circles, an account of which forms a very disproportionate amount of My Life (new ed. 1908). In 1887 he made a tour of the States and Canada, delivering six Lowell lectures in Boston. During the latter part of his life he was keenly interested in the social problems of his times, expressing his views with forcible advocacy several books. The Royal Medal in 1868 and the first Darwin Medal, 1890, were presented to him by the Royal Society. He was president of the Entomological Society in 1870-71. In 1889 he received the degree of D.C.L. from Oxford University. In 1881 he received a pension at the hands of Mr. Gladstone. Among his other trade in European countries. In 1878 Mr. Gladstone. Among his other the term W. was applied to candidates in the House of Commons, who were nominated by political associations.

Walkyries, see VALKYRIES.
Wall, Great, of China, see CHINA.
Wallaby, see KANGAROO.
W. W. Wally Great, of China, see CHINA.
Wallaby, see KANGAROO.
W. Wally Great, of China, see CHINA.
Wallaby, see KANGAROO.
W. Wallace, Mans Hobitable? 1907: The response of Democracy, 1913; Social botany. He became a schoolmaster in a private school in Leicester, and Wallace, Lewis (Lew) (1827-1905). in a private school in Leicester, and Wallace, Lewis (Lew) (1827-1905), made the acquaintance of H. W. an American soldier and writer, born Bates. In 1848 the two friends set at Brookville, Indiana. He fought in out for the Amazon, but separated the Mexican War (1846-47) and as a later. A large part of his collection federalist in the Civil War (1862-64), was hunty with the chiri which he believe the the chiri was the format with the chiri which he believe the the chiral way for the chiral set of Fort was hunty with the chiral way for the chiral set of Fort was hunty with the chiral way for the chiral set of Fort was hunty with the chiral way for the chiral set of Fort was hunty with the chiral set of Fort was set of Fort wa later. A large part of his collection federalist in the Civil War (1862-64), was burnt with the ship in which he was returning. From 1554 to 1862 W. Donelson (1862). He was appointed was in the Malay Archipelago; here he established the 'Wallace Line,' governor of New Mexico Territory 200logically separating Lombok and Celebes from Bali and Borneo. His own work and the reading of Malthus' Sessay on Population led him to the idea of the 'survival of the fittest,' as a correlation of natural selection, and English art connoiseur, born in

London, the natural son of the Fifeshire. He was at first a book-Marchioness of Hertford. He educated in Paris, where he gathe together a valuable collection, s in 1857. He then helped the Marc in 1857. of Heriford, his half-brother, forming his collection, which inherited in 1876, and which was led the chorograph, and besides bequeathed by his widow to the British nation in 1897.

Scott Interest: Commentical Theorems and Interest: Commentical Theorems and Interest: Commentical Theorems and Interest: Commentical Theorems and Interest: Commentical Theorems and

Wallace, Robert (1831-99), a Scottish theologian and politician, born near Cupar, Fife. In 1872 he became professor of church history at the university there, and on leaving the ministry was editor of the Scotsman (1876-80). He represented E. Edinburgh in parliament (1886-99) and was strongly opposed to the Home Rule Bill. See Smith and Wallace, Life and Last Leaves, 1903. Wallace, Sir William (c. 1272-1305)

a Scottish patriot, born probably at Elderslie, near Paisley. He came of family whose members were enemies of England; he first took up enemies of England; he first took up arms against the English in 1297. It was an opportune moment for a Scottish rising. Edward I had taken advantage of the dispute as to the succession to the Scottish throne to possess himself of the country. In 1296 he ravaged the country and made prisoner John de Baliol, at the time the occupant of the Scottish throne. John de Warenne was appointed guardian of Scotland, and line rasses He toured the U.S.A and S. America, and travelled it was a success. He toured the U.S.A and S. America, and travelled it was a success. He toured the U.S.A and S. America, and travelled it was a success. He toured the U.S.A and S. America, and travelled it was a success. He toured the U.S.A and S. America, and travelled it was a success. He toured the U.S.A and S. America, and travelled it was a success. He toured the U.S.A and S. America, and travelled it was a success. He toured the U.S.A and S. America, and travelled it was a success. He toured the U.S.A and S. America, and travelled it was a success. He toured the U.S.A and S. America, and travelled it was a success. He toured the U.S.A and S. America, and travelled it was a success. He toured the U.S.A and S. America, and travelled it was a success. He toured the U.S.A and S. America, and travelled it was a success. He toured the U.S.A and S. America, and travelled it was a success. He toured the U.S.A and S. America, and travelled it was a success. He toured the U.S.A and S. America, and travelled it was a success. He toured the U.S.A and S. America, and travelled it was a success. He toured the U.S.A and S. America, and travelled it was a success. He toured the U.S.A and S. America, and travelled it was a success. He toured the U.S.A and S. America, and travelled it was a success. He toured the under the succession to the succession to the developer the U.S.A and S. America, and travelled it was a success. He toured the succession to the succession pointed guardian of Scotland, and English sheriffs were set up in the southern shires and in Ayr and Lanark. In 1297 the English barons Lanark. In 1297 the English barons and clergy were in revolt against Edward I, while he was absorbed in preparations for the French war. Thus W seized his opportunity, he organised the Scottish insurgents in the name of John de Baliol, killed Sir William Hezelrig, the English sheriff of Lanark, and became joint warden of Scotland. He next drove the English out of Perth, Stirling, and Lanark shires, besieged and Lanark shires, besieged and Lanark shires, besieged and Lanark shires, besieged and Stirling castles, and defea was the work of 1297, bu ravaging Northumberland, morland, and Cumberland, he was the work of 1297, bu see Embankment morland, and Cumberland, he was was constructed to provent the defeated by Edward I. (1298) and resigned the of Scotland. After this h to France and solicited Norway, France, and the of Scotland. After this h is of an ancient forest. The forence and solicited solicited

journals wrote: A New Book of Interest; Geometrical Theorems and Analytical Formula.

Wallace, William (1844-97). philosopher, born at Cupar, Fife. He was professor of moral philosophy at Oxford in 1882-97, and published The Logic of Hegel. 1873; Hegel's Philo-sophy of Mind; The Life of Arthur

Schopenhauer, 1890. Wallace, William Vincent (1814-65), a composer. W. was an Irishman, born in Waterford. He was leader of the orchestra in a Dublin theatre for a number of years. His first oper-Marilana was produced in 1845 an was a success. He toured the U.S.A

line passes between the Suln and Philippine Is., along the Straits of Macassar and between Lombok and Macassar and between Louis of it is Java, and the fauna to the W. of it is E. of

between the Archduke Ferdinand and the Venetians. On the outbreak of the Bohemian revolt he obtained a number of beautiful varieties of the command of an army, defeated Mansfeldt (q.v.), and conquered agreat bearing yellow, brown, red, and stretch of country. He was created Duke of Mecklenburg by the emperor. Resigned his command in 1830, but sown in May. had it restored again the next year. In 1632 Gustavas Adolphus invaded northern Germany. W. met him at Having studied at Upsala he entered Lützen, Nov. 1632, and a fierce battle took place, but in spite of W.'s efforts the battle was a triumph for the Protestants. Gustavus, however, was killed. Seeming to lack vigour in continuing the war, he was accused of continuing the war, he was accused of aiming at sovereignty, and was disgraced. He retired to Egra, where he was murdered. Schiller dealt with his life both in prose and in poetry. See Life by L. von Ranke, 1910.

Waller, Edmund (1606-87), an English poet, born at Coleshill, Bucks.

Engush poet, born at Coleshill, Bucks. mains, and appears in the Domesday He was a student of Lincoln's Inn in Book. It has a large number of 1622, and four years later was M.P. for interesting churches. Pop. 2800. Chipping Wycombe, and tor Amersham in 1628 and 1640. In this latter year he sat in the Long Parliament, and was chosen by the House to buttons, britannia and brass ware. conduct the impeachment of Crawley Pop. (1910) 11,155. for his judgment in the ship-money Wallington, a par. of Surrey, Engcase. But he was at heart a royalist, land, 2 m. S.W. of Croydon, noted and having been caught plotting to for its cultivation of lavender. Pop. seize London for Charles I., was (1911) 5200.

arrested and expelled the House Wallis, John (1616-1703), a mathematical mathematic was commuted to a heavy fine and keeper of the archives, 1658-1703, banishment. He was, however, par-He introduced the principles of doned in 1651 by Cromwell's influence, analogy and continuity into mathematical in 1655 entitled: A Paneaurical science and published laudatory verses upon matical science and published laudatory v arrested and expelled the House Wallis, John (1616-1703), a mathe-(1643). He was prisoner in the Tower matician, was Savilian professor of and published laudatory verses upon him in 1655 entitled: A Panegyric range of the higher algebra. He published Lord Protector. But he also lished Arithmetica Infinitorum, 1655, which contained the germs of the which contained the germs of the which contained and invented the well's death (1658), and in 1660 published To the King, upon his Majesty's Happy Relurn. His Divine Poems

in Bohemia (1620) and the palatinate (1621-22), and at the outbreak of the (1621-22), and at the outbreak of the civil War was made a colonel in the parliamentary army. He took Ports-Republic of 1875 earned for him the mouth (1642), Hereford (1643), and Arundel Castle (1644), but was removed from command in 1645 by the self-denying ordinance and became a Presbyterian leader in parliament. In 1647 he began to levy troops to resist the army, and was imprisoned by that faction (1648-51). He was again arrested in 1659 and important of the same group of prisoned in the Tower for having languages as modern French, but plotted a royalist rising, but recovered his seat in parliament (1660).

same year.

Wallflower (Cheiranthus cheiri), a fragrant cruciferous perennial plant.

Wallin, Johan Olof (1779-1839), a Swedish poet, born in Dalecarlia. upon a clerical career, and after preaching at Solna, Ulriksdal, and Vesteräs, became archbishop of Vesteräs, Upsala. His poetry is chiefly ligious in character. Among religious in character. Among his secular poems are Uppfostraren (The Educator), which won a prize at the Swedish Academy, and a song on George Washington.

Wallingford, a parl. bor. on the W. bank of the Thames, about 50 m. from London. It has ancient Roman remains, and appears in the Domesday

differential calculus, and invented the symbol & for infinity.

Happy Relurn. His Divine Poems
appeared in 1685.
Wallon, Alexandre Henri (1812appeared in 1685.
Wallon, Alexandre Henri (1812appeared in 1685.
Wallon, Alexandre Henri (18121904), a French historian and politician. He began his political career
a parliamentary general, was the son as deputy for Guadeloupe in 1848.
of Sir Thomas W., licutenant of On his return to the Chamber of
Dover. Becoming a soldier, he served
in Bohemia (1620) and the palatinate
formation of a party which bore his
1691-290, and at the outbreek of the

and sat on the council of state the vowels or to render them indeterminute as contrasted with French.

the Cornish.

Wall-paper, a coloured or decorated paper used as an ornamental covering for the inner surface of the walls of a room. Plain coloured paper may be 'ingrain' when the colour runs 'ingrain' when the colour runs throughout the substance of the paper, or printed, when the colour is only on the surface. Some of the best patterned papers are 'hand-printed'; that is, the colours are laid on with wooden blocks, the finer details being supplied by strips of copper placed edgewise in the block. A large number of excellent papers are machineprinted, and these are usually cheaper. The price is not a good index of the artistic or intrinsic value of a W. Exclusive designs are invariably expensive, but are reduced in price as they become more widely produced. Enormous quantities of inartistic papers are printed to appeal to a crude taste, but there is no difficulty in purchasing effective designs at no patterns greater cost. Pictorial should be avoided except for nursery decoration; conventional designs are more pleasing and less exhausting. In general, large designs should only be used for large rooms. Diningrooms are well suited by browns and reds of rich tone, libraries and studies by subdued blues and greens; drawing-rooms should give a light effect; bedroom decoration should not be too glaring nor two gloomy, and any design that presents rows of con-spicuous details in any direction should be avoided. In calculating the number of pieces of W. needed for a room, it should be remembered that a piece of English made paper measures 12 yds. by 21 in., French paper 9 yds. by 18 in., and Japanese paper 12 yds. by 36 in. Wallsend: 1. A tn. an

bor. of Northumberland, the Tyne. Its name is taken i position at the end of the old : building, metal smelting and manufacture, and chemicals. Pop. 22,416.

2. A tn. of New South Wales, Australia, 13 m. from Newcastle, a great

teror in the open · a wall

clude frost, but bloom can be protected by placing poles against the wall at a slight slant and stretching over them sacking, scrim, or other

The people in appearance resemble | Kent. It was in ancient times one of the Cinque Ports, and is one of the reputed landing-places of Julius Cæsar. Walmer Castle is a relic of the days when it was an important place to be defended from foreign inroads. Pop. 5848. 2. A township and holiday resort of Cape Colony, district of Port Elizabeth. Pop. 1920. Walney Island, off the N.W. coast of Lancashire, between Morecambe

Bay and the mouth of the Duddon,

near Barrow-in-Furness.

Walnut (Juglans regia), a hand-some and useful tree, hardy in Britain though not a native. Beside its nuts, which are of much value as a dessert delicacy, the wood is in great demand by cabinet-makers. Sugar has been made from the sap, and the aromatic leaves have been used in pharmacy. The rind of the fruit yields a dark brown dye, and the seeds contain an

oil used by painters as a drying oil.
Walpole, Horace, fourth Earl of
Orford (1717-97), born in London, being the youngest son of Robert W., the English statesman. Even while at school he was well provided for by the sinecures which, by the influence of his father, he held. At the age of twenty-two he started on a continental tour, which formed so essential a part of the education of the gilded youth of the 18th century. He visited Franco and Italy together with the poet Gray. Whilst on the tour he met Horace Mann, with whom Whilst on the he maintained a correspondence for some very considerable period. He returned to England, having quarrelled with Gray, and entered parliament. He held a seat in parliament continu-ously up to 1768. It is, however, not as a politician but as an author that he is famous. His memoirs and correspondence are of the greatest . th century.

in England Its chief industries are ship gave him an insignt into politics og, metal smelting and manu-which was as deep as it was crudite. He was a some very

of one of the

at Strawl from 1747, and his house became the colliery centre. Pop. 4500.

Wall Trees, the only method of centre of fashionable learning in Engraving some of the more delicate and. He set up a printing press there and published much that was his own and published much that was his own and his friends. Gray's Odes were ie pro- issued from here, as was the Castle of provid- Otranto, which established a new kind to ex- of romantic novel, a novel gloomy As an anti-

following Royal and 1758; Life II., 1768; material. Walmer, or Walmerstreet: 1. A tn. Walmer, or Walmerstreet: 1. A tn. Ancedotes of Painting in England, and watering-place on the coast of 1762-71. Amongst the more im-

Walpole, Robert (1676-1745), an English statesman, born at Houghton in Norfolk. A Whig by persuasion and upbringing, he entered parliament in 1701 as M.P. for Castle Rising, and in the next parliament, the first of the reign of Queen Anne, for Lynn. He quickly distinguished himself, and in 1708 he became secretary for war. On the accession of the Whigs in 1710 he was accused of peculation, a somewhat were transferred to Eichstadt, where peculation, a somewhat graphy, a miraculous healing oil flowed were transferred to Eichstadt, where recime and charge, and wahis office and sent to the Terror of the result of the received in her honour. Walpole, Robert (1676-1745),

Protestant succession, however, restored him to favour, and in 1715 he became Chancellor of the Exchequer, falls properly on Feb. 25, but as and practically George I.'s chief in some German calendars it is minister. On the dismissal of Townshend, he also resigned and opposed has become associated, in a quite associated to the content of the content strongly the policy of Stanhope and Sunderland. His greatest victory in opposition was the rejection in 1718 of the Peerage Bill, which limited the prerogative of the Crown and which would have increased enormously the nower of the House of Lords. The power of the House of Lords. country seemed to be on the verge of roun. But W. made these ruins stepping stones to success. He became declared, should the firm be Townshend. No longer, he if attacked, when it is capable of fighting fiercely and of inflicting declared, should the firm be Townshend and Walpole, but Walpole and Townshend. He now became the virtual ruler of England, and acquired the office of Prime Minister. Since the king spoke only German and could not understand English, W. presided over the cabinet. His policy was a policy of peace. As a financial minister, few have equalled him. He had no high Ideals, but was actuated throughout by motives of strong common sense. On the death of George I, his position seemed to be imperilled, but Caroline of Anspach ruin. But W. made these ruins step-George I. his position seemed to be imperilled, but Caroline of Anspach realised his true ability, gave him her support, and kept him in office. His trade in harness, saddlery, and leather excise scheme of 1733 would have made London a free port, but was not popular since it was not understood. He remained in office until 1742. In 1739 the war of 'Jenkins Ear' was declared, and W. ought to have resigned since he had declared war much against his will, but he (1705-s). He was a friend and corre

portant of his memoirs may be meniclung obstinately to office, and only tioned: Memoirs of the Last Ten resigned when his majority had Years of the Reign of George II.; dwindled to two. His enemies tried Memoirs of the Reign of George III. to impeach him, but he was still Memoirs of the Reign of George III. to impeach him, but he was still 1771; and Journal of the Reign of Strong enough to escape that. He George III. 1771-83. See also Life by Austin Dobson, 1890; L. B. Seeley, Horace Walpole and his World, 1884; he had given up office. See Coxe, Walpole's Letters to Sir Horace Walpole's World, 1913.

Macaulay), 1833; A. D. Greenwood, Horace Walpole's World, 1913.

Walpole Robert (1676-1745) an Walpole Robert (1676-1745) an Walpole Robert (1676-1745) and Walpo Walpurga, St. (otherwise Walburga) (d. c. 779), followed her brothers St. Wilibald and St. Wunnibald (sons of a king of the West Saxons), in the time of St. Boniface, from her native country, England, to Germany, to help them in extending Christianity. After the death of Wunnibald she directed his convent at Heidenheim until her death. Her bones, from which, according to the oldest biography, a mirgalloughed linged flowed.

accidental way, with some of the most noted popular superstitions.

most noted popular superstitions.

Walrus, Sea Horse, Sea Cow, or
Morse (Trichechus rosmarus), a large
marine carnivore confined to the
Arctic Circle, though formerly of
much wider range, it having been
ruthlessly hunted for its immense
tusk-like upper canines, its hide, and
its cil the a gregarious animal and nania for speculation culminated in ruthlessly hunted for its immense 1721 in the South Sea Bubble, public credit was at a discount, and the country seemed to be on the verge of quiet and inoffensive in disposition ruth. But W. made these ruins step, except during the breeding season or except during the breeding season, or

spondent of Pope, and a literary col- | Waltham cerning Women, 1691; Letters and Poems, 1692; and Esculapius, published posthumously, 1714. See his Letters in Elwin and Courthope's edition of Pope (vol. vi.), and Life by

Cibber, 1753. Walsham, North, an urban dist. and market tn., Norfolk, England, 14 m. N.E. of Norwich. Pop. (1911)

Walsingham, a tn. Norfolk, England, 6 m. N.E. of Fakenham, has an Augustine priory (12th century) with a shrine of the Virgin much visited by

mediæval pilgrims. Pop. (1911) 900. Walsingham, a tn., Norfolk, Eng-land, 4½ m. S. of Wells, has an Augustine priory (12th century) with a shrine of the Virgin much visited by

mediæval pilgrims. Pop. 900.
Walsingham, Sir Francis (c. 1530-90), an English statesman, was educated at King's College, Cambridge. He travelled, during Queen Mary's reign, studying foreign politics, but on the accession of Elizabeth returned to England, and in 1569 acted as chief | of the secret service in London. was envoy to Paris to ask indulgence for the Huguenots, 1570, and two years later protected the English Protestants during the St. Bartholomew massacre. From 1573 to 1590 he was secretary of state, and was frequently employed by Elizabeth in foreign affairs although she neglected his advice. He secured the conviction of William Parry, 1585, Anthony Babington, 1586, and Mary Queen of

He compiled Chronicon at Stafford. Henry V. Angliæ; I podigma Neustriæ, a record

Walsoken, an urban dist. on the border of Norfolk, England, 1 m. N.E. of Wisbech of which it is a suburb. Pop. (1911) 3898.

Walter, John, founder of the Times

(q.v.)
Walterhausen, a tu., Saxe-Coburg-Gotha, Germany, 7 m. W.S.W. of Gotha, on the Bodewasser; has a mediæval castle used for administrative purposes, and various manufs. Pop. 7534.

Waltham, a city of the U.S.A., in Meetadion. The first edition differs Middlesex co., Massachusetts. 9 m. materially from the second, which W. of Boston. It has the American appeared under W.'s superintendence

Watch Company, laborator of Vanbrugh and Congreve. largest watch factory in the world, the His writings include a Dialogue Con- and numerous cotton mills. The city also produces automobiles, carriages and waggons, bicycles, organs, saddiery, harness, furniture, and men's clothing. Pop. (1910) 27,834. Waltham, Waltham Abboy, or

Waltham Holy Cross, an ancient market tn. on the R. Lea. 121 m. from London. The first notice of it occurs in the reign of Canute, but it is now famous chiefly for its ancient abbey church. There are also large powder-mills belonging to the government. Area 11,870 acres. Pop. 6846.

Walthamstow, an urban dist., Essex, and suburb of London, 6 m. N.E. of Liverpool Street, Pop. (1911) 125,356.

Walther von der Vogelweide (c. 1160-1230), the greatest of the German minnesingers, was probably a native of Tyrol. He was of noble birth, and having learned his art under Reinmar the Old, found a patron in Duke Frederick I. at the court of Vienna where he stayed until 1198. After this he visited several towns, including Mainz and Magdeburg, and in 1204 won the poetical confest at the Wartburg.

Walton, Brian (1600-61), an English divine, born in Cleveland dist., Yorkshire. Ho was incumbent of St. Martin's Orgar, Loudon, 1628-41, and of Sandon, Essex. 1636-41, but being ejected from his livings for ritualism. withdrew to Oxford where he studied oriental languages. In 1617 he came to London and devoted himself to his great Polyglot Bible (6 vols. 1654-57).

Scots, 1586, and it was he who urged in which nine languages are used:

Chaldee. Ethiople, Greek, brow, Persian, Syriac, and

He was consecrated Chester in 1660. Other an Introductio to Oriental and Considerator Conlefence of the Polyglot.

Izaak (1593-1683), the The Compleat Angler, born He was apprenticed to an ironmonger in London after very Majora, now lost.

Walsoken, an urban dist. on the border of Norfolk, England, 1 m. verses, and in 1640 he prefixed a life border of Norfolk, England, 1 m. of Donne to the first follow dition of that author's Sermons, which was much approved by John Hales. He afterwards iss wards is: In edition of ol-1651 he toniana Wollon, and two years later produced his famous treatise The Compleat Angler, or the Contemplative Man's

The former is in the form of a in 1655. dialogue between Piscator and Viator, while the latter has three characters, Piscator, Venator, and Auceps. In 1665 he gave to the world his Life of Richard Hooker, and in 1670 appeared his Life of George Herbert, followed in 1678 by that of Bishop Sanderson. Cotton's dialogue between Piscator and Viator was published as a second part in the 5th edition of The Compleal Angler.

edition of The Compleat Angler.
Walton-le-Dale, an urban dist. of
N.E. Lancashire, England, on the
Ribble, 2 m. S.E. of Preston, has cotton mills, corn mills, and iron foundries. Pop. (1911) 12,352.
Walton-on-Thames, an urban dist.
and tn. of Surrey, England, 5 m.S.W. of

Kingston; a favourite resort for boating and angling. Pop. (1911) 12,858.

Walton-on-the-Hill, a tn. of S.W. Lancashire, England, is now a suburb

of Liverpool.

Walton-on-the-Naze, or Walton-le-Soken, an urban dist, and par. of N.E. Essex, England, 7 m. S. of Harwich. is a favourite watering-place, with a regular service of steamers from London. It is chiefly modern, the ancient church and village having been

engulfed by the sea. Pop. (1911) 2175.
Waltz, a dance, introduced on the continent early in the 19th cencontinent early in the 19th century, for any number of separate couples. The music is in three-four time and the motion is a gliding and revolving one. Among the most popular composers are the two Strausses. The Ws. composed by Chopin and Liszt are of quite a different code and are not intended for ent order, and are not intended for use as dance music.

Walworth, a dist. and parl. div. of the bor. of Newington, Surrey, Eng-land. Pop. 60,000.

Wampum, the shell beads used by the N. American Indians for dress ornamentation, for symbolic belts exchanged in inter-tribal treaties, and as a regular currency between them and the early colonists.

Wandering Jew, The, see JEW, THE

WANDERING.

Wanderoo, a name properly applied to the Ceylonese species of Semno-pilheci, or Sacred Monkeys, but also given to Macacus silenus, a monkey with a large lion-like mane or ruff.

Wandewash, a tn. of North Arcot Wandewash, a th. of North Arcou-District. Madras, British India, the scene of several engagements in the Carnatic Wars. Pop. (1901) 5971. Wandsbek, or Wandsbeck, a th. of Schleswig-Holstein, Prussia, 3 m. N.E.

of Hamburg, of which it practically 75). Pop. 35,212.

Wandsworth, a metropolitan and parliamentary bor, and parish in the co. of London, England. It is the largest of the metropolitan boroughs (9108 acres) and includes the parisnes of Putney, Clapham, Streatham, Bai-ham, and Tooting. The industries include oil-mills, dye-works, paper-

meiude oil-mills, dye-works, paper-mills, calico-printing, and breweries. Pop. (1911) 311,402. Wanganui: 1. A tn. and port, North Is., New Zealand, on the Wan-ganui R., 134 in. N. of Wellington by rail; has refrigerating works and a collegiate school. Pop. 8200. 2. A riv. of North Is., New Zealand, risea near Mt. Tongariro and discharges on the W. coast, 60 m. S.E. of New Ply-

mouth. Length 120 m.

Wangaratta, a tn. of Victoria, Australia, 130 m. N.E. of Melbourne, at the junction of the Ovens and King rivers, and the counties of Bogong. Delatite, and Moira; is the centre of an agricultural and fruit-growing district. Pop. 3500.

Wanks, see Coco. Wanley, Rev. Nathaniel (1634-80), an English divine and compiler, born at Leicester. He became rector of Beeby, Leicestershire, and vicar of Trinity Church, Coventry (1662). He published The Wonders of the of. Little World (1678), a treatise, with anecdotes, on the prodigies of human nature, and a funeral sermon, Peace and Rest for the Upright, 1681.

Wanlockhead, a vil. of Dumfriesshire, Scotland, 1½ m. S.W. of Leadhills, has lead mines opened in 1680.

Pop. (1911) 620.

Wanstead, an urban dist. of Essex, England, 7 m. N.E. of London. Pop. (1911) 13,830.

Wantage, a market tn. of Berkshire, England, 13 m. S.W. of Oxford. It is famous as the birthplace of Alfred the Great (849), to whom a statue by Count Gleichen, was erected in 1877. Bishop Butler (1692-1752), author of The Analogy of Religion, was also a native. Pop. (1911) 3628.

Wapakoneta, a tn. and co. seat of Anglaize co.. Ohio, U.S.A., 12 m. S. by W. of Lima, is the centre of an agricultural and manufacturing (furniture, hollow-ware, and chairs) district. Pop. (1910) 5349.

Wapenshaw (A.-S. waepen, weapon; sceawian, to show), in Scots feudal history, an exhibition of arms, according to the rank of the individual, made formerly at certain times in every district. Such exhibitions or meetings were not designed for military exercises, but with the object of forms a suburb, has breweries, dis-showing that the lieges were properly tilleries, and oleograph factories, provided with arms. The name is tilleries, and oleograph factories, provided with arms. The name is There is a monument to Claudius, sometimes used now to denote the author of Der II and sheeker links (1771) periodical meetings of volunteer corps.

Wapiti, or Cervus canadensis. 3.

from 4-5 ft. at the shoulder, and the antlers are large and finely developed.

Wappers, Egide Charles Gustave (1803-74), a Belgian painter, born at Antwerp. His first exhibited picture. Devotion of the Burgomaster of Leiden' (1830), received immediate recognition as a great work, and W. was appointed professor of painting at Antwerp (1832), director of the Academy (1840-53), and president of the Belgian National Museum (1846-53). His other paintings include 'Episode of the Belgian Revolution of 1830,' 'Christ at the Tomb.' 'Camöens,' and 'The Defence of <u>53)</u>. Rhodes.'

Wapping, a dist. of London, on the N. bank of the Thames, in the metro-politan bor. of Stepney. The London

Docks are here. War. The conduct of modern warfare is very different to that of the Ws. of the past. Although it is almost a contradiction in terms to speak of civilised W., nevertheless W. in its conduct is much more humane than it previously was. The absence of looting and of the molestation of peaceful inhabitants has done much to make W. less dreadful than heretofore. W. as waged in Roman times was at least disciplined and organised, but the downpour on the Roman em-pire of Goths, Huns, and Vandals reduced warfare to methods of barbarism. Improvement was slow but sure during the feudal period, the mediæval idea of chivalry having much to do with this. But the introduction of gunpowder and the perfecting of modern fire arms have done much by its power of quick annihilation to make W. more terrible but at the same time less brutal and barbarous. The inventions of modern times have made W. a speedier matter than previously it was. Mobilisation is rapid, transit is rapid, and communications are rapid. The results of W. nowadays are also more terrible and more far-reaching than they were in the past, so that in a manner W. itself acts & to the nations. W. may much to do with this. But the intro-W. may to the nations. as either defensive or

may be naval or militar.

ever, usually both. The influence of sea power cannot well, however, be over-estimated. The navy is of use for defence, for conveying transports, and for offence against another marity from the second volume of On War of To-day, by Friedrich von Bernhardi, translated by Karl von Donat (1913, Rees), that famous military expert points out that to act over, usually both. The influence of sea power cannot well, however, be over-estimated. The navy is of use

large and magnificent deer once offensively is almost imperative in widely distributed throughout N. Modern warfare, and goes on to say that when an army is for the time compelled to act on the defensive it that when an army is for the time compelled to act on the defensive it should only do so until it finds it possible to take up the offensive. Tacti-

sible to take up the ohensive. Tactical efficiency and strategic mobility are of the utmost importance.

Warasdin, see Varasdin.

Waratah: 1. A tn. of Northumberland co., New South Wales, 4 in.

N.W. of Newcastle, has coal mines. N.W. of Associate, has coal mine-copper and tin smelting, stone quar-ries, brick-making, and fruit-growing. Pop. 3100. 2. Or Mount Bischoll, a post tn., Russell co., Tasmania, 82 m. W. of Launceston, has some of the richest tin-mines in the world, also gold, silver, and bismuth. Pop. (district) 5000.

Warbeck, Perkin (1474-99), a pretender to the English throne in the reign of Henry VII. He was a native of Tournay, and appeared in 1490 at the Burgundian court in the character of the younger of the two princes whom Richard III. was held to have murdered in the Tower. Here he was made welcome by his 'aunt' (the Duchess of Burgundy). He was received in England and also at the court of the French king. Going to Warbeck, Perkin (1474-99), a pretencourt of the French king. Going to Scotland, he was received by James IV. and given Catherine Gordon as a In 1498 he invaded the S.W. of England, besieged Exeter, but was captured and brought to the Tower. In the following year he managed to escape, but was recaptured and exe-

cuted. Warblers, or Sylvidae, a family of passerine birds distinguished from the thrushes by their more delicate structure and more subulate bill. all birds of unpretentions

· e, but many of the foreign more gally coloured.

perished in the burning of the Amazon on his way to Panama. He published The Crescent and the Cross, 1844;

Memoirs of Prince Rupert, 1849; and Darien, or the Merchant Prince, 1851.
Warburton, John (1682-1759), an English antiquary and Somerset berald in the College of Arms (1720- in London. In 1847 he was elected 59), was born in Lancashire. He col- A.R.A., becoming full R.A. in 1855. lected manuscripts and rare books, and his unique collection of Elizabethan plays is supposed to have been burnt by his cook. The remainder of his collection was sold in 1766. W. made a survey of the Roman Wall (1753) and published maps of Northumberland (1716), Middlesex (1749). and other counties.

Warburton, Peter Egerton (1813-89), an English Australian explorer and author, born near Norwich. He travelled through N.W. Australia on a camel and narrowly escaped starvation in the descrt. He published Major Warburton's Diary, 1866; and Journey Across the Western Interior

of Australia, 1875.

Warburton, Sir Robert (1842-99), a British soldier, born in Afghanistan. He took part in the Abyssinian War (1867-68) and in the Afghan War. From 1879-97 he was warden of the Khyber Pass. He served with the He expedition (1897-98). Tirah Wrote Eighteen Years in the Khyber.

1900.

Warburton, William (1698-1779), an English author and divine, was born at Newark and educated at the grammar school there. On leaving school he was placed in an attorney's office, and in 1719 he set up in busioffice, and in 1/15 he so. He was orness at his native town. He was ordained deacon in 1723. His literary numerous, and filled seven volumes when collected in 1788 by Bishop Hurd. He materially assisted Theobald in his edition of Shakespeare (1733), and there is little doubt that this work owes much of its excellence to the advice of W. In 1799 he was made Bishop of Gloucester. He was a great friend of Pope, whose Essay on Man he vigorously defended in his Works of the Learned.

Ward, a minor who has been legally placed under the care of a guardian The term is also used for a subdivision of a city for civic pur-

poses. Ward, BROWNE, Ward, Artemus, CHARLES FARRAR. see

demued to stand in the pillory.

Ward, Edward Matthew (1816-79) English historical and an painter, born at Pimlico, London. He studied in the Royal Academy Schools, at Rome, and at Munich under Cornelius. His 'Cimabue and Giotto' won him instant recognition His paintings include eight frescoes His paintings include eight frescoes in the House of Commons (1853); 'Dr. Johnson in the Anteroom of Lord Chesterfield,' 1845, and 'South Sea Bubble,' 1847, in the National Gallery; 'Charles IL and Nell Gwyn,' 1848. See Dafforne, Life and Works of E. M. Ward, 1879.

Ward, Elizabeth Stuart (née Phelps) (1844,1911) an American poyelist

(1844-1911), an American novelist and philanthropist, born at Andover. Massachusetts. In 1888 she married the Rev. Herbert D. Ward. Many of her books were of a religious or mystical character. She published The Gates Ajar, 1868; Men, Women. and Ghosts, 1869; Hedged In, 1870; The Silent Parlner, 1871; Poetic Studies, 1875; The Story of Avis, 1877; Doctor Zay, 1882; Beyond the Gates, 1883; Come Forth, 1890; Avery, 1902; Trixy, 1905; The Outh of Allegiance. 1909. See her Chapters from a Life, 1896. (1844-1911), an American novelist a Life, 1896.

Ward, Harry Marshall (1854-1906). an English botanist, was educated at Owens College, Manchester, and Christ's College, Cambridge. He was cryptogamic botanist to the Ceylon government (1880-2); professor of botany at the Forest School (1885-95) and at Cambridge University

(1895-1906). His works include: Timber and Some of its Diseases, 1859: The Oak, 1892; Grasses, 1901; Dis-eases of Plants, 1901; and Trees, 1904-5. Ward, James (1769-1859), an Eng-

lish animal and genre painter and engraver, born in London. In 1791 he was appointed painter and mezzotint engraver to the Prince of Wale: in 1807 he became A.R.A., and R.A. in 1811. His best pictures include: Alderney Bull, Cow, and Caft, Cattle Piece, 1807; Fighting Bull, and Donkey and Pigs (S. Kensington Museum). His best mezzotint-'Cornelius' after Rembrandt,

and 'Mrs. Bellington,' after Reynolds. Ward, John Quincy Adams (1830-1910), an American sculptor, born at Urbano, Ohio. From 1850-56 he Urbano, Ohio. From 1850-56 he studied under H. K. Brown, assisting Ward, Edward (1667-1731), an Eng-blim with the equestrian statue of lish humorist and satirical writer, Washington in Union Square, New born in Oxfordshire. He kept a tavern in Moorfields, London, and in New York. In 1861 he opened a studio published a great deal of coarse verse 'Indian Hunter' was erected in satirising the Whigs and the Low Central Park, where also are his Church party. For his Hudibras' Freedman' and 'Shakespeare,' He Redicitus, 1705, he was twice condemued to stand in the pillors. ington for the Treasury Buildings.

1868), an English botanist, born in Wardian case (q.v.) by which growing plants can be sent from one part of plants can be sent from one part of the world to another without being injured. The banana was introduced into Fiji and Samoa, and tea from Shanghai to the Himalayas by its means. He published: On the Growth of Plants in Closely-glaced Cases, 1842.

Ward, Robert Plumer (1765-1846), a politician, was called to the bar in 1790, and entered parliament twelve 1790, and enterta parameter oversex sater. He was Under-Secretary for Foreign Affairs (1805-6), a commissioner of the Admiratby (1807-11), and Clerk of the Ordnance from 1811 until 1823, when he retired from parliament, and was appointed by Perceval Auditor of the Civil List. He was the author of three novels, and he kept a diary from 1809, a portion of which was published in 1850. There is a biography by Phipps,

Ward, William George (1812-82), an English Roman Catholic theologian and philosopher, born in London. Howent to Oxford and soon fell under the influence of Newman to whose views he had previously been opposed. He openly defended Newman's Tract XC., 1841, and in 1844 clearly defined his views in The Ideal of a Christian Church. In 1845 he entered the Roman Catholic Church and became professor at St. Edmund's College, Ware (1852-58). He was editor of the Dublin Review (1863-78) and a leader of t

Warden, in appointed for the

distances over sea; they are in pots and plunged in fibre. These cases are often the culture of filmy and other ferns House.

the culture of filmy and other ferns in dwelling-rooms.

Wardlaw, Elizabeth, Lady (1677-Schwerin, Germany, 20 m. N.W. of 1727), a Scottish poetess, born at Pitfirrane, Fifeshire, and married 19134.

She wrote Hardyknute (1719) which she published as an ancient ballad.

Ward, Nathaniel Bagshaw (1791-68), an English botauist, born in In 1833 he invented the ballads has also been claimed for her, but with very doubtful justification.

Wardmote. In the city of London an annual court or meeting held in each ward of the city under the presidency of the alderman. Its powers, which formerly extended to matters concerning the watch, the police, etc., are now merely nominal. The common councillors of the city

are elected at the W. Wardroom. In old naval ships the room, placed immediately over the gunroom, where the lieutenants and other principal officers slept and messed. In a modern man o' war it is a cabin for the accommodation of lieutenants, and other officers of W. rank, including pursers, naval instructors, doctors, and engineers.

Wardship in foudal times, an incident of tenure (q.v.) by knight service, This right gave the lord the guardianship in chivalry of the heirs (males under twenty-one and females under fourteen) of his tenants, and with such guardianship the right to the lands of the heir, without having to account for the profits, until the latter came of age. W. was abolished

under the Commonwealth. Ware: 1. An urban dist., Hertford-shire, England, on the Lea, 2 m. N.E. of Hertford, has malting and brickmaking industries. The great bed of Ware, mentioned by Shakespeare, is now at Rye House. Pop. (1911) 5812. 2. Atn., Hampshire co., Massachusetts. U.S.A., on the Ware, 25 m. W. of

appointed for tiprotection of st
The W. of the Cinque Ports was created by William the Conqueror with extensive jurisdiction over the adjacent coast land. The Ws. of the marches were appointed to protect the boundaries between England the boundaries between England was auditor-general of Ireland (1632-19), M.P. for Dublin University from 1631-37, and again in 1661, a prisoner in the Tower boundaries between the boundaries between th Use Scotland or Wates.

Wardha, a tn., Wardha dist.,
Central Provinces, India, 45 m. S.W.
of Nagpur, is a great cotton centro.
Pop. 10,000. The dist. has an area of
2420 sq. m. and pop. 390,000.
Wardian Case, a small glass structure of the structure of the structure of the frome, near Poole Harbour,
m. E. of Dorchester, has the rem. E. of Dorchester, has the re-

m. E. of Dorchester, has the re-

, see BONDED WARE-9.10

for his investigations on the algebraical curves, Miscellanea Analytica oraical curves, Bresedanca Algebrai-corum Curtarum . . . , 1772, etc. See

Gent. Mag., ii. 1798.

Warkworth, a small scaport of Northumberland, England, on the Coquet, 1 m. from the North Sea, 6 m. S.E. of Alawick. The ruins of W. castle and W. hermitage (mentioned in Percy's Reliques) are near by. It has a 14th century bridge over the Dee. There are salt and brick manufs. Coal and fire-clay are worked near Amble. Pop. (1911) 720.

Warming, see HEAT AND HEATING. Warminster, a tn. of Salisbury Plain (W.), Wiltshire, England, 8 m. S. of Trowbridge. It has an ancient chapel, an endowed grammar-school, and Roman remains near by. The malting and corn trade flourishes. Longleat with its deer-park, seat of the marqueses of Bath, is 5 m. S.E.

Pop. (1911) 5492.

Warner, Charles (1846-1909). stage-name of Charles John Lickfold. an English actor. He first appeared at Windsor Castle in Richelieu, during a command performance by Samuel Phelps's company (1861). He also with Phelps during the played with Frieips during the latter's last appearances. as Buckingham in Richard III., and De Mauprat in Richelieu. W. acted in Leah Kleschna (1905), as Leontes in The Winter's Tale (1906), and went to America (1907). See Green Room Book, 1900. 1909: The Times (Feb. 13, 1909).

Warner, Chas. Dudley (1829-1900), an American author, born at Plain-He also edited a Library of the World's

Best Literature.

Warner, Richard (1711-75), English botanist and scholar, edu-la township of Borung co., Victoria, cated at Oxford. He collected and Australia, 75 m. from Ararat. It cultivated exotic plants, publishing manufs. carriages and implements, Planto. Woodfordienses (on plants and has brass and iron foundries. found near his home, Woodford Row, Pop. 2600. found near his home, Woodford Row, in Essex) in 1771. Miller named the Warneria genus of plants after him. W. was noted for his critical knowound near his home, woodlord Row, Pop. 2000. in Essex) in 1771. Miller named the Warrandice, in Scote law, the Warneria genus of plants after him. which a party conveying a subject or right is bound to slakespeare, and translated demnify the grantee, disponee, or some comedies of Plantus. His receiver of the right, in case of evictives of the right.

Warner, Suran (1819-85).

professorship (1760). He took the American authoress, born at New degree of M.D. (1767), but did not York, author of The Wide, Wide practise for long, and is best known World, Queechy, Melbourne House, etc., published under the pseudonym of Elizabeth Wetherell. They are all domestic stories full of sentimentality and pathos. Her other works were mostly religious.

Warner, William (1558-1609), a poet, born in London, studied at Oxford. and was an attorney in London. In 1585 he published seven tales in prose entitled Pan his Syrinx, and in 1595 a translation of the Menochmi of Plautus. His chief work was Albion's England, published in 1586 in thirteen books of fourteensyllabled verse, and republished with three additional books in 1606.

Warnsdorf, a tn. (formed 1870). in the extreme N. of Bohemia, Austria-Hungary, on the Saxony frontier, 60 m. from Prague. Cotton and textile industries are important. Pop.

about 23,220.
War Office, the headquarters of war Onice, the headquarters of the British army, situated in a com-paratively new pile of buildings in Whitehall. It was originally in the Pall Mall. The department, dur-ing the last Conservative government, was thoroughly overhauled and revised on the recommendation of a specially appointed committee over which Lord Esher presided. An army council was formed which consisted of the Secretary and Under-Secretary for War, together with the Financial Secretary and four military members. Each of these four memhers has some special department of the military service to superintend: they are responsible directly to the Secretary of State for War, who is, an American author, born at Plain-Secretary of State for War, who is, field, Massachusetts. He practised of course, directly responsible to law in Chicago for some years, Among parliament. Each of the divisions his works are: My Summer in a superintended by the military members are sub-divided, and each sub-life of Washington Iring, Life of division is under the control of a Captain John Smith, In the Levant, etc. He collaborated with Mark military members. The inspector-wise division is under the control of the collaborated with Mark military members. The inspector-wise division is the forces who have taken capiain John Smun, In the Levant, director who is responsible to the etc. He collaborated with Mark military members. The inspector-Twain in The Gilded Age, and was general of the forces, who has taken co-editor of Harper's Magazine, to the place of the now obsolete committed he contributed papers on the mander-in-chief, carries out the South, Mexico, and the Great West. plans of the army council and reports upon the efficiency of the men and the utility of the reforms. Warracknabeal, or Werracknabeal.

library was bequeathed to Wadham tion, or of real claims or burdens College, Oxford. being made effectual against the an subject, arising out of obligations or

Warren

transactions antecedent to the date of the conveyance. W. is either personal or real. Personal W. is that by which the granter and his heirs are bound personally and is either general, when interpreted by the rules of implied warrandice, or special, which again is divided into the conveyance. Warranty, a W. within the meaning which again is divided into the conveyance. Warranty, a W. within the meaning which is divided into the conveyance. Warranty, a W. within the meaning which is divided into the conveyance. Warranty, a W. within the meaning with programs to goods. viz., that implied in

from fact and deed, v

made over eventually in security of

the lands conveyed.

Warrant, an instrument authorising one to do something which otherwise he has no right to do. A police W. is issued by a justice on a written and sworn information of an offence; it is addressed to the constables of his district, specifies the offence, describes the person accused, and commands the police to arrest him and bring him before justices to answer the charge. It remains in force until the charge. It remains in force until executed, and if the criminal escapes into another district the W. can be backed by indorsement of the justices of such district, so as to be enforceable against the criminal in such district. A general W. (i.c., one which purports to authorise the arrest of unnamed persons without previous evidence of their guilt or knowledge of their persons) to seize suspected persons and a general search W. empowering messengers to seize documents are alike illegal. See also Arrest, Search Warrant.
Warrant of Attorney, a written
instrument executed by one person

authorising another to confess judg-ment against him in an action for a certain named amount. It is often given by way of security by a prospective debtor and enables the creditor to obtain judgment against the debtor without the delay and

expense of an action.

Naval.—The Officers. name applies to all officers who hold rank by virtue not of commission but rank by virtue not of comments there were action must have been made during of warrant. Formerly there were action must have been made during of warrant officers than the treaty for sale; a W. given after many more warrant officers that the treaty for sale; a W. given after the rate of the present time—officers the sale would require a new continued. whose work was continued even after the vessel had bee off forming the bulk of them. officers who now hold comm

with reference to goods

the subject of a contract of in transactions, or (c) reach of which gives a right by the granter is liable for every defect in the right which he has granted. Real W. is that by which pudiated. A representation made by certain lands, called W. lands, are the seller at the time of sale will only a require to a W. if made with that the seller at the time of sale will only amount to a W. if made with that intention and the test of such inten-tion is to determine whether the seller purported to assert a fact of which the buyer was ignorant. If not, then there is no W.; e.g., if a picture dealer describes some pictures as 'Animal Studies, Landseer,' it is probable he is going further than to express a mere opinion; but if he describes them as having been painted by some remote painter, c.g., Parrhasius, his representation would be a mere opinion as no one could be sure of authenticity in such a case. (Jend-winer, Slade.) The term 'sound 'on the W. of a horse or other animals implies that the seller warrants the animal to be free of any disease or seeds of disease which would diminish or in process of time diminish the natural usefulness of the animal for the work to which it would properly and ordinarily be put. Temporary lameness, a cough, the defects of being nerved or chest-foundered, all constitute unsoundness, but not mere poorness of shape, crib-biting, mere poorness of snape, crib-plink, nor roaring, unless symptomatic of actual disease. A general W. does not give a right to sue in respect of defects obvious to both parties, but in this respect it is to be observed that a purchaser is not bound to use extreme diligence in finding defects; and, again, it has been held in horse-cases that if the defect, though obvious, is not of a permanently injurivious, is not of a permanently injuri-ous character, the purchaser can sue for damages. A W. to ground an action must have been made during the treaty for sale; a W. given after

cap. of Trumbulleo... ohoning R., 53 m. with manufacturewere formerly of warrant
Cadets and midshipmen at the prosent day hold their positions by warrant and not by commission.

Millary.—An intermediate step
between a non-commissioned and a

commissioned and a rant and not by commission.

Military.—An intermediate step between a non-commissioned and a commissioned rank. The term W.O. is applied to the conductor of the applied to the conductor of the Army Ordnance Corps, staff-ser-Oil and natural gas abound, iron-ore

and petroleum are found. It is named a after the American patriot. Joseph W. Pop. (1910) 11.080. Sec Schenck Pop. (1910) 11,000. See Schenek and Rann, History of Warren County, Pennsylvania, 1887. 3. A tn. of Bris-tol co., Rhode Is., U.S.A., 6½ m. from Fall P., Mass., on Narragansett Bay. Cottons, varn, and cordage are among

Warren:

warren, in popular language, an enclosure made for the breeding of rabbits. The enclosure is usually effected with wire netting, about 6 in. of which is turned flat on the ground inwards. If the grass is good, it will support about twenty rabbits per acre, but overcrowding soon causes heavy mortality. Furze and juniper are often grown in Ws. and impart a good flavour to the flesh. Sometimes cabbage and other

crops are cultivated for food.

Warren, Gouverneur Kemble (1830-82), an American general born at Coldspring, New York. He was educated at West Point for the army, which he entered at the age of twenty. He took an active part in the cam-paign of the American Civil War, being early in the war gazetted as brigadier-general of the volunteer He was an extremely brilliant general, but his extreme brilliance led him into some positions which a less brilliant but safer man would not have entered. He fell under the supicions of several generals and was finally relieved of his command by Sheridan, but was com-pletely exonerated by the court of He was promoted to the inquiry. rank of brigadier-general in the regular army. As an engineer his survey

work was extremely valuable.
Warren, Sir John Borlase, Bart.
(1753-1822), an English admiral, born at Stapleford, Nottinghamshire. He entered the navy (1771) and saw service with Howe and Sir Charles Hardy in N. America, and in 1794 had command of a force which captured three French frigates. He protected British trade by this and similar deeds. but perhaps his best service was the defeat of a French fleet which planned a landing in Ireland (1798). In 1806 he captured the Marengo and in 1810

became an admiral.

Warren, Leicester, see Dr. Tabley, John Byrne Leicester Warren. Warren, Samuel (1807-77), a Welsh lawyer and author, born in Denbighshire. He became Q.C. (1851), recorder of Hull (1851-74) and was an M.P. for three years. M.P. for three years. He wrote first for Blackwood's Magazine, in which Meden, 2½ m. from Shirebrook appeared his Passages from the Diary of a Lale Physician and Ten Thousand a Year, the latter scoring a great success. Other works are Now and Then and The Lily and the Bee.

Warrenpoint, a watering-place of Down co. (S.W.), Ireland, 7 m. S.E. of Newry, at the head of Carlingford Lough. Mourne Mts. rise behind it. Rosstrevor, a much-frequented watering place, is 3 m. E. Pop. (1911) 1800.

Warrenshurg, the cap. of Johnson co., Missouri, U.S.A., on Black R., 50 m. E.S.E. of Kansas City. There are blue sandstone quarries, and stock-raising and agriculture are widely carried on. Pop. (1910) 4689. Warrington (ancient Walintune), a

municipal and parl, bor, of Lanca-shire, England, on the Mersey, 16 m. from Liverpool and Manchester. It is on the Manchester Ship Canal below the Latchford locks. There are iron. glass, cotton, leather, soap, beer, and chamical manufactures. W. has a cruciform parish church, a town-hall, and some old timbered houses. It was on the Roman road from Chester.

Pop. (1911) 72,178.
Warrnambool, a seaport of Villiers co., Victoria, Australia, on Lady Bay. Pacific Ocean, 50 m. from Portland. There are salt-water baths, botanical gardens, a museum, a steeplechase course, and factories. It has a fine

harbour, and a lighthouse on the N. shore of the bay. Much sandstone is quarried. Pop. 6700.

Warsaw, formerly the capital of Poland, but now the capital of the Russian province of Poland. It is situated on the left bank of the Vistula, and lies about 695 m. S.W. of St. Petersburg. It is built in terraces which rise in tiers from the river. The town itself is surrounded by suburbs, the most important of which is Praga, which stands on the right bank of the river and is joined to the capital by a bridge. It is the third largest city of the Russian Empire, ranking next only to St. Petersburg and Moscow. Its buildings are particularly fine: it has many churches, Catholic, Greek, and Lutheran. The castle is a splendid building, and contains various art treasures. The town is well garrisoned by Russians, the army of occupation numbering well over 25,000. The university has been once suppressed, but has now nearly 100 professors and over 1000 students. The population of the city numbers 783,000, one-third of whom are Jews. The city played an important part in the struggle for independence, and is still the headquarters of the Russian revolutionists.

Warsop, a tn. of Nottinghamshire, England, 5 m. from Mansfield, on the Meden, 2½ m. from Shirebrook station. There are horse and cattle fairs. Pop. (1911) 4224.

disappear without any cause, especially in the young. They Australia, 75 m. S.W. of Brisbanc, on are very vascular, and are covered Contadamine R., in an agricultural with some thickness of scaly epidermis, which easily becomes rubbed off. In children, the best course is to leave them alone, as they cause little inconvenience and ultimately disappear. In older people they should be treated, as there is always the possibility of them being the manifestation of a malignant growth. A variety of W., known as 'anatomic tubercle,' is occasionally found on the hands of those who handle the tissues of tuberculous subjects in dissections.

and the Bromberg canal

Warton, Joseph (1722-1800), an English critic and poet, son of Thomas W., educated at Winchester and Oxford. where he formed a close friendship with William Collins. He wrote verses, and in his Odes and in his Essay on Pope he opposed the artificiality and the moralising in verse prevalent at the time. He edited Virgil in Latin and English, and wrote on Shakesspeare and Homer. argued with Dr. Literary Club. See

Thoma Warton, English poet-laure. of poetry, brother of Joseph (q.v.). secure position

and other minor works, but his chief title to fame is his History of English

Poetry, 1774-81.
Warwick: 1. The cap. of Warwickshire, Central England, on the Avon, 20 m. S.E. of Birmingham. Warwick Castle, an old for tains fine paintif cluding the famo cluding the famo labeled to the control of probably dates Conquest, and is

the present buildir Chapel of St. Mε

from 1464. With . rough | killed

of the manner in which they are U.S.A., in Kent co., on Narragasett formed, and they usually appear and Bay, with various manuts. Pop. apparent (1910) 26,629. 3. A tn. of Merivale co., mg. They Australia, 75 m. S.W. of Brisbanc, on and wine-growing district. There are also gold and coal mines, and quarries of marble and stone. Pop. about 4000.

Warwick, Guy of, see Guy or WARWICK.

Warwick, Richard Neville, Earl of (1428-71), surnamed the Kingmaker, He was the eldest son of the Earl of Salisbury, and married the daughter and heiress of the Earl of Warwick, succeeding to the title in 1449. He was the most active of all the sup-porters of the Yorkist house, and his dissections.

Warthe (Polish Warta), a riv. of Russian Poland, Prussia, and Germany, rising in Piotrkow gov.. S.W. Poland, in the Carpathians, about 35 m. from Cracow, flowing N.W. and W. past Posen to join the Oder at Küstrin. It is about 450 m. long, navigable from Kolo, and connected with the Vistula through the Netze and the Rrombert canal. word carried great weight in their councils. In 1455 he won the first attempt to protect London from the victorious wife of Henry VI., he was defeated, but the victory of Edward. Earl of March and York, son of the defeated leader of the Yorkists at Wakefield, and now head of the house of York, at Mortimer's Cross, enabled him to enter London and proclaim Edward king as Edward IV. This wafollowed up by the crushing defeat of the Lancastrians at Towton (1461).

placed on the throne of Henry VI. being placed in

had

tor of England. This became more Poetry of and more obvious since Edward IV., a man of great talent and ability, wasted his time in lascivious living.

Anjou, and they landed in and placed Henry VI. again throne. Edward IV. fled, but returned, having obtained Burgundy, and defeated and the Library and t

killed the Kingmaker at Barnet (1471). See Galrdner, Lancaster and York, 1874: Ramsay, Lancaster and York, 1892.

Warwickshire, a midland co., England, bounded on the N. by Staffordshire, S. by Gloucestershire and Oxfordshire, E. by the shires of Leicesvariable, though there are no very great elevations, Broom Hill (830 ft.) being the greatest height. The principal rivers are the Avon, with its numerous tributaries, which runs right across the county, the Stour, and the Tame. In the N. is the region that was once Arden Forest, made famous by Shakespeare. The county possesses immense coalfields in the N., ironstone, lime, and cement are also worked. Almost the whole county is under cultivation, pasturage occupying the largest area; dairy farming and market gardening are carried on successfully, and oats and wheat form the main crops. In the N. is the great industrial centre of Birmingham, the principal manufactures being iron goods, hardware, fire-arms, jewellery, etc. Bicycles, motor cars, watches, and ribbons are manufactured at Coventry and other places. Besides the above-mentioned towns the most important are Leamington, famous for its Spa; Nuneaton; ington, lamous for its Spa; Nuneaton; Stratford-on-Avon, famous as the birthplace of Shakespeare; Sutton Coldfield; and Warwick, the county town. The county is divided into four parliamentary divisions, each returning one member. There is a university at Birmingham and an Edward VI. grammar school; Rugby possesses a famous public school and at sesses a famous public school, and at Studley Castle is the Lady Warwick Horticultural College for women. The county is famous for its antiquities, Warwick Castle, the residence of the Earl of Warwick, and Kenilworth Castle being the most famous, though there are many others. Coventry church is notable, and there are numerous village churches of interest. There are ruins of a Cistercian monastery at Coombe Abbey near Coventry, besides others at Merevale. Stone-leigh, Maxstone, and Wroxall. Edgehill gave its name to the battle of 1612, in the Civil War. The area of the county is 979 sq. m. Pop. 1.024,196.

Wasatch, see Wahsatch Moun-TAINS.

Wash, The, an inlet (22 m. by 15 m.) of the North Sca, on the E. coast of England, between Norfolk and Lincoln counties, receiving the Welland, Ouse, Nen, and other rivers. Its shores are low and marshy. It is mostly shallow, and contains numerous shoals, its two chief channels being called the 'Deeps' of Boston and Lynn. It is the remnant of a larger bay which once covered much of the bordering Fens. Sea walls now protect the marsh lands. King John here (1216).

ter and Northampton, and W. by Washburne, Elinu Benjamin (1987), an American statesman, born at Bessended from an old Washburne, Elihu Benjamin (1816-Livermore. Descended from an old family of English Puritan settlers. In early life followed journalism and In early life followed journalism and teaching. Studied law. Sat in Congress (1853-69) as a Whig. advocating retrenchment. Became Secretary of State under Grant. Went as American ambassador to Paris, and was present during the siege (1870). Left his art and literary treasures to Chicago. He wrote: Peccelladians of Chicago. He wrote: Recollections of a Minister to France, 1887, and a History of the English Settlement in

History of the Engish Settement in Edwards County, 1882. Washburne, Cadwallader Colden (1818-82), brother of the above, an American soldier, born at Livermore. Worked on his father's farm as a boy. Studied law, proving a successful lawyer and business man. Sat as Whig in Congress (1855-61). Fought for Federal army in Civil War, showing great bravery at Grand Coteau. Founded Washburne Observatory at Wisconsin University, and by his will made other large educational and

charitable bequests.

Washing Machines, see LAUNDRIES. Washington, the cap. of the U.S.A., in the dist. of Columbia. on the l. b. of the Potomac. It was fixed there by an Act of Congress passed in 1790, and government the was transferred thither from Philadelphia in 1800. The city was regularly laid out, according to the design of Major d'Enfant, and now covers an area of more than 10 sq. m. The capitol is the cen-tral site. This splendid building stands on a rising ground at the eastern end of Pennsylvania Avenue. It is constructed of freestone and composed of a centre and two wings. A Corinthian portico extends the length of the centre, which is occupied by the rotunda, 96 ft. in height and diameter. The Senate Chamber is in the N. wing. The Senate Chamber is in the N. wing. The city has many other magnificent buildings, among which may be briefly named the Patent Office, the General Post Office, the National Observatory, the Concoran Gallery of Art, the Columbian University, and the Howard (coloured) University.

The population consists chiefly of The population consists chiefly of government officials and the various professional men and tradespeople required to minister to their wants. Pop. (1910) 331,069. 2. A bor. of Pennsylvania. U.S.A., county seat of Washington co., 25 m. from Pitts-burg. It is a well-built city, the seat of Washington and Jefferson Colleges. It has iron, glass, and carbon works. Pop. (1910) 18,778. 3. A th. of Indiana, U.S.A. county seat of Daviess co... 110 m. S.W. of Indianopolis. lost his baggage and treasure waggons | It is the centre of a farming and lumber region. Pop. (1910) 7854. 4. The

county seat of Beaufort co., N. Caro- estates. He was sent as a delegate to lina, U.S.A., on the Pamlico R. It has both the first and second Continental an extensive trade in farm produce,

cereals, and lumber. Pop. (1910) 6211. Washington, a Pacific state of the U.S.A., was formerly part of Oregon. It is situated in the extreme N.W., bounded N. by British Columbia. It was created a territory in 1853, and in 1889 was admitted to statehood. Area, 66,127 sq. m. Pop. (1910) 1,141,990. The state is traversed from N. to S. by the Cascade Range, whose general alti-tude is between 6000 and 7000 ft., but there are several volcanic peaks rising above 10,000 ft. In the N.W. is Puget Sound, an inlet with many ramifications, and there are several indentations on the Pacific const.

The Columbia R. flows along part of its S. boundary, entering the state from British Columbia on the X. Its chief affluent is the Snake R. which joins it near South Ainsworth, Lumbering, fishing, and agriculture when the Constitution of the U.S.A. are the leading occupations, but the mining of gold, silver, and coal is also carried on. There are eighteen There are eighteen Indian reservations in the state, covering an area of 3642 sq. m., the largest being that of Coleville (2031) sq. m.). The cap is Olympia, and the chief cities are Scattle, Tacoma, Spokane, Bellingham, and Everett. The University of Washington near Seattle has an attendance of over 2000 students.

Washington, a par. of England, about 6 m. from England. There a par. of Durham,

mines. Pop. (1911) 4600.

Washington, Booker Tal undernity of former polisions of 1858, an American educationalist. Of African descent: born He died at Mount Vernon his last years a slave at Hale's Ford, Virginia, a me With great determination he secured an education at the Hampton Industrial Institute, Virginia, and studied later at Wayland Seminary. Was elected in 1881 to the presidency of the Tuskegee Institute, a higher and Institute, a His works Negro, 1909; Negro, 1909; War Institute on the higher and Institute of the Negro, 1909; War Institute of the hearts of his countrymen. He holds a unique place in the history of the Republic, which was a way down the Whisky With great determination he secured

Working with the Hana: by G. H. Pike, 1902.

estates of Lord Fairfax, a " He joined the army later, an Colonel Fry drove the Frenc.

Pennsylvania. He was on the staff of General Edward Braddock at the shire, U.S.A., 75 m. N.E. of Concord. time of his disastrous defeat in 1753.

On his marriage he resigned his commission and settled down at Mount Tuckerman's Ravine is a deep general vernon, and managed his wife's large in the S.E.

Congresses, and after the second, he undertook the fortifying of New York. He was chosen unanimously by the colonies to be commander in-chief of the forces in 1775, when war with Great Britain was declared. He planned the expeditions against Canada, and in 1776 drove the British out of Boston. British out of Boston. He proved a very able commander, and discip-lined and trained well his troop, a motley crew, mostly citizen volunteers. His fellow-officers resented his friendship with Lafayette, and there were many jealousies and backbitings.

May 1787. was formed and was naturally elected as first president on the union of the original thirteen states a few months later. He made a good president, and was re-elected after the first four years. He absolutely refused to stand for a third term, thus creating a precedent. He paid official visits to New England, 1789 and 1799, but was essentially a true Southerner. He was a Federalist, and during his second presidency became unpopular

with the Democratic republicans. He
co, too, by his Treaty of
during the war between
and France. The attacks of
und enmity of former poli-

had d though

put down the Whisky

· political intrigue, with

Washington, George (1732-99), first president of the U.S.A., born at Bridge's Creek, Virginia. At the age of sixteen he became surveyor of the greatness of the nation he was

Mount, culminating hite Mts., in the Presi-

made in 1846 with Great Britain by which the boundary W. of the Rocky Mts. was established. 2. That made in 1854 with Great Britain relative to fisheries, duties, and navigation in British N. America, often called the 'Reciprocity' Treaty. 3. That made in 1871 with Great Britain for the settlement of all causes of difference. Under its terms the Alabama claims, the San Juan boundaries, and certain fisheries disputes were settled by arbitration. This treaty further laid down the following rules: That it is the duty of a neutral state, which desires to remain at peace with beldesires to remain a peace with neights of neutrality, to abstain from partici-pating in the war, and to see that no acts be committed by any one in the territory which would constitute co-operation in the war.

Washington Court-House, the cap. of Fayette co., Ohio, U.S.A., on Sugar (Point) Creek, 40 m. S.W. of Columbus, an important railway centre. It has a poultry packing house, and manufs. of furniture, stoves, soap, etc. Pop. about (1910) 7277.

Washita, scc OUACHITA.

Wasmes, a com. of Hainault prov., Belgium, 6 m. W.N.W. of Mons, with coal mines and industrial activities.

Pop. 16,000.

Wasp, a name given to various menonterous insects. The Veshymenopterous insects. The Vespide or true Ws. are distributed throughout the world, though most numerous in the tropics. A characteristic feature is the longitudine. The ing of the wings when at rest. The social Ws. (Vespine), which form a sub-family, almost all employ unlocal females for workers. The developed females for workers. The community is of seasonal duration only; the mother or queen, after hiding during the winter, emerges in the early spring and starts to build a nest of paper worked up with her larvæ change into pupæ and again into young workers. These continue the construction of the nest and the care of the young, leaving the queen to devote herself chiefly to egg laying until the nest contains some hundred inmates. Not until the end of the season are drones and fully-developed females produced. These leave the nest, and, after pairing, the females Bees par., Cumberland, England, seek shelter for the winter. It is the 11 m. from Keswick, drained by the destruction of the queen Ws. in early 1rt into the Irish Sea. It is 3 m. long, destriction of the queen wis. In early internating 650 yds. in width. agency that checks the numbers of Watch, see Horozogy—Watchs. Ws., but while they are undeniably Watch, on board-ship, a division of

Washington. Treaties of: 1. That serious enemies of the fruit-grower. they destroy great numbers of other insects. The other sub-family of the Vesnide is the Eumine (solitary Ws.). which usually make earthen nests, capturing and storing insects as food. All the females are fully developed. and, although there are no social communities, a stage in the development of communal life is seen in certain species, which build their cells close together. There are three close together. There are three hymenopterous families of digging Ws.: the Scollidæ, the females of which search for beetles' larvæ in the ground, paralyse them with their sting, and lay an egg on the body; the Pompilidæ, which construct their nests in sandy banks, capturing spiders to feed their grubs; and the Sphegidæ, which make nests in the ground or in wood and capture insects to furnish food for their larvæ.

Wassail (A.-S. wes and hal, be thou whole, of good health), originally an expression of good wishes at festivi-ties, especially a 'toasting' or saluta-tion in drinking. Later it was used for a drinking-bout or carouse, and then for the beverage used (especially at Christmas and New Year). This consisted of spiced ale (or wine), sweetened, and flavoured with cinnamon, cloves, roasted apples, toast, etc. It is sometimes called 'lamb's

wool '

Waste, in law a term denoting any spoil or destruction done or permitted by the tenant to houses, woods, lands, or other corporeal hereditaments (q.r.) during the continuance of his (q.v.) during the continuance of his particular estate (q.v.) therein. W. is said to be either (a) roluntary, i.e. acts of commission, such as pulling down buildings, felling timber, opening mines, etc.; (b) permissive, i.e. acts of omission such as non-repair of buildings—a tenant for life is only liable for such W. if the duty to reair has been avreagly east upon him. pair has been expressly cast upon him a nest of paper worked up with her pair has been expressly east upon him mandibles from vegetable substances. By the settlement—and (c) equitable, she constructs six or eight six-sided or as it has been called 'malicious or cells and in them lays eggs from which humoursome' W., as by destruction grubs quickly hatch. They are fed of the family mansion or pictures, on honey and insects, and when full- a tenant for life even though exgrown the cells are scaled up and the pressly declared by the settlement to larve change into pupe and again be 'not impeachable' for W. is into average light or courts ble. We nevertheless liable for equitable W. The remedy for W. is by action for damages and injunction (q.v.).

Waste Lands, see RECLAMATION OF

LAND.

Waste Products, see REPUSE, DIS-POSAL OF

Wast Water, a small lake of St.

migrating from regions near the Alps to the foot of them, and countries without coal but with W. are estabra Falls is h it, and a SC was promoted in 1906 to supply power from

the Victoria Falls. Waterford: 1. A co. in the prov. of Munster, Ireland, bounded on the N. by Kilkenny and Tipperary, S. by the Atlantic, E. by Waterford Harbour and Wexford, and W. by Cork. The coastline is much indented, the principal inlets be more Bay,

Ardmore Báy

The districts t mountainous, the chief ranges being the Comeragh and Monavallagh Mts. (2597),

2605 ft. in the S.W. The principal rivers are the Suir and the Blackwater, famous for the salmon fishing. Agriculture is successfully carried on, but the greatest area is under pasturage, and the rearing of livestock is increasing; the principal crops are oats, potatoes, and turnips. The fisheries form one of the chief industries, cotton is manufactured, and there are breweries, distilleries, and flour mills. Marble Marble The chief and copper are found. The chief towns are W., Dungarvan, and Lismore. The county comprises eight baronies and returns two members to parliament. W. was originally inhabited by the Danes, of whom there are numerous relies. At Lismore there is an old castle, at Ardmore 7th century monastic remains and a holy well, and at Mulleray there is a Trappist monastery (1830). Area 717 sq. m. Pop. (1911) 83,766. 2. A municipal, parl., and co. bor. and city, cap. of co. Waterford, Ireland. It is stiputed on the B. Cair. It is situated on the R. Suir. 94 m. S.W. of Dublin (111 m. by rail). A wooden bridge with thirty-nine arches conneets it with the suburb of Ferrybank on the N. bank of the river. tains Protestant and Roman Catholic cathedrals, to the former belong a deanery connection m l

training hall, law courts, and barracks. Plugments of the old city walls remain, notably, Reginald's Tower dating notably. Reginald's Tower dating Water-Lify, the name given to the from the 11th century. A large export trade is carried on, especially in Nuphar and also of Neiumblum, all

continent being formed of horizontal strata. W. have been used to generate formed by the estuary of the Surand power by means of water-wheels for centuries past; turbines are replacing cation with Fishguard, Glasgow, centuries past; turbines are replacing cation with risinguard, Guscow, them, and are particularly used for the generating electricity by turning dynamos. The effect, industrially, of this is very great. Factories are Prince John landed there in 1185, and afterwards as king in 1210. Richard II. landed there in 1291 and 1392. James II. sailed from there to France after the Battle of the Boyne, and William sailed from there to England. During the Civil War it was taken by Ireton. It received its first charter from King John in 1206. Pop. (1911) 27,430. It returns one member

to parliament. Waterford, Louisa, Marchioness cl (1818-91), an English artist and bookde Rothesay. She married the third Marquis of W. Ford Castle in Northumberland contains many of her finest works, such as 'Spring,' 'Christinas,' 'The Miracle of Healing the Two Blind Men, which were highly praised by Watts. Many of her drawings were exhibited (1892).

Water-gauge, an instrument for measuring the height of water. The commonest form is that fixed to the front of boilers, consisting of a per-pendicular glass tube, communica-ting at the upper end with the steam space of the boiler and at the lower end with the water in the boiler.

Water Glass, see Solubli: GLASS. Water Hemlock, Cowbane, or Cicula virosa, a tall umbelliferous per-ennial, growing in damp places. bearing large umbels of white flowers. Its poisonous turnip-shaped root has frequently been eaten, with fatal results.

Water-Hen, see Moontien, Waterland, Daniel (1683-1740), on English theologian and controversialist, studied at Cambridge from 1699. The Earl of Surroy was his patron. W. became caugh of Windsor (1727), archdeacon of Middlesex and vicar of Twickenham (1730). His principal works were on the great Arian controversy, and he was considered to have extinguished Arian-

in Vindication 1719-23) and the Further Defence in answer to S. Clarke (1725); Scripture Undicated in answer to Tyndai (1734) and Review of the Eucharist, 1737. See Van Mildert's ed. of his Works with Memoir (1823-28).

Among his pub-

Water-Lilies, 1905.

Wellington, from its strategic position relatively to the line of fortresses on wounded the N.E. frontier of France, as the unknown. most advantageous place to resist the advance of Napoleon on the Belgian capital. The outstanding features of battle were the extraordinary this and long-continued resistance of the British infantry to the unremitting! cannonade of the French artillery, the dramatic arrival of Blücher and Bulow with three corps of the Prussian army, and the routing of Na-poleon's celebrated 'Old Guard' under Ney. Creasy gives the following under Ney. Creasy gives the following figures of the respective strengths of the two armies: Wellington, 49,608 infantry, 12,402 cavalry, 5645 artillery with 156 guns (of which total scarcely 24,000 were British); Napoleon, 48,950 infantry, 15,765 cavalry, 7232 artillery with 246 guns (comprising the flaver of the patient) (comprising 'the flower of the national forces of France '). The British occu-pied a position facing W., and across the main routes from Brussels to Charleroi and Nivelles. The central body held the building and gardens of Hougomont, the left centre the farm of La Haye Sainte. Napoleon concentrated his army on a low range of hills facing the British position, and after despatching a corps to watch the Prussian advances he began the action with a fierce attack upon Hougomont. Throughout the day he sent column after column of infantry to the point, strengthened his attack with repeated cavalry charges, and all through maintained a terrific and an through managed a triple artillery fire; but the British inflormed company, founded 1556.

fantry, under the indomitable Picton, in spite of the treachery and poltronery of the Dutch and Belgian to meadows, as is found in the case of the day which are periodically flooded. vital to the safety of the French. But are kept dry, but during the rest of the battle was over from this time, for other Prussian forces were constantly appearing nearer and nearer to the Water Measurements. In civil English left near Papelotte and from engineering the unit is the gallon.

belonging to the natural order Nym-, St. Lambert. As a last resort Napoleon pheaces. Britain produces white endeavoured in vain to break the and yellow W.-Ls., which are found British line with the Old Guard under floating in still waters. See Conrad, Ney: Wellington them took the Ney; Wellington then took the offensive, advanced with his whole Waterloo, a vil. situated a few miles army, and sent the French flying S. of Brussels, chosen by the Duke of from the field. The losses were enormous: British, 15,000 killed and wounded; Prussians, 7000; French,

> Waterloo: 1. The cap. of Black Hawk co., Iowa, U.S.A., on Cedar R., 52 m. from Cedar Rapids, 6 m. from Cedar Falls. Agriculture, dairying, and poultry-raising are the chief pursuits. There are foundries, canning and packing industries, and various suits. manufactures. Pop. (1910) 26,693. 2. A municipality of New South Wales, Australia, a suburb of Sydney (21 m.

> distant). Pop. 10,000. (or Waterlo) Antoni (c. 1609-c. 1676), a Waterloo (or Anthonie) (c. 1609-c. 1676), a Dutch landscape-painter. Houbraken praised his clear skies and rich, varied foliage, but his pictures were unsigned, and those attributed to him are rare. The museums of Ambetterder and Stuffhim are rare. The museums of Amsterdam and Rotterdam and Stuttgart Gallery contain examples of his work, but he is best known for his elever etchings. Weenix painted figures for his pictures.

> Waterloo Cup, The, see Coursing.
> Waterloo-with-Seaforth, a tn. and
> watering place of Lancashire (S.W.
> coast), England, on the Irish Sea, at
> the Mersey's mouth, a residential
> suburb (N.W.) of Liverpool (5 m.
> distant). Pop (1911) 26, 200 Pop. (1911) 26,399. distant).

Waterman, one who conveys passengers for hire in a boat on a river. The only large body of W. in England are those employed on the Thames at London. Before the introduction of coaches the Thames was the great highway. The W. or lightermen are an

troonery of the Dutch and Belman to meadows, as is found in the case of allies, held out to the end of the day, those which are periodically flooded, and in the course of this heroic resisting many cases along the Thames, and ance, the Union Cavalry Brigade of in Dorset, Wilts, and Devonshire, British Royals, Scots Greys, and flood waters can be regulated, while Irish Innishillings galloped out. They in others actual irrigation is estabrendered seventy-four of Ney's guns lished. Sluices and channels are useless for the rest of the day, arranged and controlled so that water Naveleon took La Have Sainte late in may be drawn from the river passed Napoleon took La Haye Sainte late in may be drawn from the river passed the day, but only when Blücher and over meadows and discharged again Bulow were pre-sing his right. This divided his attentions between offentive and defensive, and he was obliged provide excellent early spring pasture to send out the Young Guard to occupy Planchenoit village, the defender of which had become absolutely cattle. At these times the meadows vital to the safety of the French But are kent dry, but during the rest of

The contents of a bank or reservoir are calculated in cubic feet and multiplied by 6.2355. In estimating rainfall inches are used, these merely expressing the depth attained over these merely expressing the depth attained over these merely expressing the depth attained over the content of t the area of rainfall if the surface were level, confined, and imperviouthe U.S.A. the acre-foot is the for irrigation purposes; this is:

tional area cub. ft., or 271,618 gals. imperial. one-fifth that of the stream; and the The U.S.A. gal. = 83 imperial gal. depth of water at the crest should It is convenient to measure water by its flow in open channels and pipes. is Open Channels .- A simple formula measurements. r=hydraulic mean depth, which is accurate work a hook is so arranged the area of cross-section of water that it may be placed, by means of a in square feet divided by the wetted perim ter in linear feet; i=the sine of the angle of inclination of flow; m a varying factor containing all the modifying factors. The velocity, cross-section and time being observed. the amount of discharge in a given time is easily determined. Cubic feet per minute × 9000 = approximately gallons per day. In taking account of various factors, such as roughness of material used, various empirical for-mulæ are used. D'Aroy's, a modifica-tion of Bazin's, is a simple practical one: Kuttur's one: Kutter's l formul oα, is very mst bo used an factor supplied in tables and giving the nature of the surface; it varies from '009 for well planed timber to '05 to rough natural water courses. A discharge 60 per cent. greater than in an ordinary earth channel may be obtained by using a cement surface. gauging stream velocities. float such as a bottle may be timed over a given distance, a mean result angles, the horizontal arm being held taken; several tests being another method is to distribute floats over the surface, determine the mean over a given distance, and multiply by 0.8. From the former central line surface velocity V, the mean cross-sectional velocity may be obtained by multiplying by a factor varying from '780 to '920; the factor may be obtained from tables. better form of float is a weighted rod, so devised as to reach within a rew inches of the bottom. Current meters are also used; these are practically screw propellers with a recording device to count revolutions, the propeller being composed of conlcallyshaped cups. By drawing the meter through still water it may be ' rated.' pipes. In small streams a dam may be under pressure, it is usual to be arranged with a nine water being melers. One of the depute towned

id are V-shaped. ng or notch

depth of water at the crest should not be less than 5 in.; the discharge is calculated by formula from by formula from As there is a fall in for mean velocity of flow is V= the surface of the water, gauge post- $\sqrt{2g/m} \times \sqrt{ri}$, g=32.2 ft. per sec., are placed a little up-stream; for screw, with its point at the surface of the water; it is attached to a sliding rule from which the height of water from the bottom may be read. The module is a form of measuring weir, through which water for irrigation is discharged to a consumer, the amount used being calculated by formula. For a rectangular notch Francis' formula is used: Q=3.33 (l-0·1nh) h²⁰; Q being cubic feet per second flow; l, length of crest in feet; h, depth of water in feet; n, a of the channel the formula becomes Q = 3.33, l, $h^{3/2}$. For the right-angled V noteh. Q = 2.51notch, $Q = 2.54 h^{3/2}$. Instead of notches, orifices are often used; they are generally circular or rectangular, but are only used for small con-stant discharges. The formula is stant discharges. $Q=3.9 \ d^2\sqrt{h}$, when h is the 'head' measured from the centre of the orlfice; d is the diameter. Yet another method of measuring velocity and thence flow is by means of Pitot tubes; these are tubes bent at right facing up stream, when the rise of water due to pressure is noted in the Flow in pipes .- The vertical arm. formulæ are practically the same as for open channels with modifications for friction. It is important if calculations are to be relied on that the pipes shall be laid correctly so that air cannot accumulate in bends: the alignment should be as straight as possible. The simplest formula is $\nabla = \sqrt{4yh/3}$; it is necessary to note carefully the head of water in this case, as it may be variable, and at a distance away as in reservoirs. Chezay's modification of Kutter's formula is V=C/ri; this is for clean If, however, the water is arranged with a pipe, water being melers. One of the simplest forms of collected in a vessel for a certain time and then measured. A measuring vessel is often arranged in a pipe corded on a dial. They are there or a contraint of the conditions being automatically recorded on a dial. They are the recorded on a dial of the collection of the simplest forms of water-meter is a form of turbine. The collection of the collection of the simplest forms of water-meter is a form of turbine, the collection of the simplest forms of water-meter is a form of turbine, the collection of the simplest forms of water-meter is a form of turbine, the collection of the simplest forms of water-meter is a form of turbine, the collection of the simplest forms of water-meter is a form of turbine, the collection of the collection of turbine, the collection of the collection of the collection of the collection of turbine, the collection of the collection of turbine, the collection leading from a reservoir; ordinarily good for large flows, but when pres-

Water sure diminishes there is a leakage least eleven ways of committing a of water passed through the turbine 'foul.' There are over 600 English without producing rotations. If the clubs, and the organised sport is conwater is being pumped through the trolled by the Amateur Swimming pipe, the discharge can be calculated from the pump. The Venturi-meter, invented by C. Herschel, consists of two funnel-shaped sections, of different tapers, forming a constriction in fabrics, waterproof on immersion in

ent tapers, forming a constriction in the pipe. The differences of pressure due to friction in passing through the throat of the pipe is measured, the pressure being less at the constriction than at the up-stream end. A device for registering these pressures is arranged and from its records the amount of flow is shown. There is practically no loss of head, as found in other meters. Positive meters are the only really reliable form. In

PHALUS.

Water-Ousel, see DIPPER.

Water Plants, see AQUATIC PLANTS. the goals may very from 19-30 yds., the natural boundary of a basin, from the width of the course must not exceed 20 yds., goals must be 10 ft. tions.

across and 3 ft. high above the suracross and 3 ft. high above the surface in a depth of 5 ft. or more of water, 8 ft. high from the bottom in Maybole. Pop. (1911) 1400. 2. A shallower water. A large ball, like a suburb of Londonderry, Ireland, on football, is used; there are seven the E. side of the Foyle, N.W. of players each side and a match lasts. fourteen minutes, seven minutes each

fabrics waterproof on immersion in a solution of rock alum and whiting in water, and afterwards treating with soap and water. Mr. Hall of Doncaster, 1839, used a solution of alum, white lead, and water, some-times adding acetic acid; the cloth after immersion was passed through lime-water and afterwards through a solution of boiled Irish moss. A composition for tarpaulins, etc., was formed of linseed oil and pipe-clay these the flow is controlled by a valve chiefly, with the addition of white which causes the water to pass alter-lead, burnt amber, and pumice stone, nately through two chambers of Macintosh material is made by applyknown dimensions. As soon as one ing several layers of a benzol or coal is full the water is turned into the other, the full one supplying the discharge pipe. The number of times these are filled is recorded on a dial.

The material is then rolled. If Walre meters are simply an arrange-ment of a valve which opens to dif-ferent amounts with the varying flow; the amount of opening is re-corded by a pencil and drum. From this record the flow may be calcucorded by a pencil and drum. From this record the flow may be calculated, but they are generally used as waste-water indicators, to show variations only in flow. See Hennel's Hydraulic and other Tables (2nd ed.), 1901; Neville, Hydraulic Tables, 1875; Brightmore, Principles of Water-Burghering (3rd ed.), 1905; Weisbach and Du Bois, Hydraulics and Hydraulic Motors, 1889; Hoyt is often added as a coat before heat-and Grover, River Discharge, 1907; E. C. Murphy, Accuracy of Stream Water Supply Paper No. 94, 1904. Water Melon, or Citrullus Vulgaria, a plant (ord. Cucurbitacee, with yellow flowers followed by large round frults which are cultivated in tropical countries and sometimes grown in greenhouses in Britain.

Water Overlage RAIL.

Water-Overlage RAIL grown in greenhouses and sometimes which is correctly the recommendation of the chloride, or dipped or cotton; they are exposed to the vapour of sulphur chloride, or dipped or cotton; they are exposed to the vapour of sulphur chloride, or dipped or cotton; they are exposed to the vapour of sulphur chloride, or dipped vapour of sul

in physical geography, the whole region which is drained by or contributes to the supply of a river or Water Polo, a game played in the lake. Also the line of separation bewater, a large swimming bath being tween the basins of two adjacent generally used. The distance between rivers, lakes, or drainage-valleys, or

Water-softening. Hardness way. There are many rules, and at water is due to the presence of calsoap, which is decomposed and insoluble salts of Ca and Mg are formed matters The reaction

d to precipitate ate. This does not remove the sulphate; for this purpose sodium carbonate is added. the Ca being precipitated as car-bonate, the sodium sulphate formed being soluble and innocuous. It is usual to supply the lime in defect rather than in excess, though a slight excess is claimed to have bactericidal effect. Commercially the process is carried out in its simplest form by Clark's Process, the whole being managed in tanks from which the being clear water is drawn off after settlement of precipitate. In other cases, such as Porter's, filtering is resorted to, and in yet other processes the methods are combined. Sedimenta-tion is also hastened and rendered more complete by allowing the fluid to pass through tanks and pipes with shelves and baffle plates inserted; these are arranged for easy removal and cleaning. The chief point is to diminish the velocity of flow, and to arrange for taking off as far as possible surface water only. The water from a tank which tips out the contents automatically into the softening tank, the required chemicals being admitted at the same time. allow the softened water to flow into a receiver for storage. Hardness of water is measured in degrees. It is tested by shaking with standard soap solution; or any soap solution, in which case standard solution of carbonate of lime is similarly agitated

and the results compared. Water-Soldier, see STRATIOTES. Water-Spaniel, see Spaniels. Waterspout. A W. appears as a

conical mass with concave sides rising inverted cone of cloud. cal joining portion has an unsteady undulatory motion, and the whole W. pursues an irregular path. The conditions for formation appear to be a whirlwind occurring over the sea or a large lake during the prevalence of a variable in cost i humid atmosphere. The rise of heated air is accompanied by inrushing wind, tion Commission which lashes up the water into waves, water as follows:

cium sulphate, and the bicarbonate; and the foam and spindrift is carried of calcium and magnesium; in con-upwards; it is possible that with the sequence they do not lather with rapid expansion of rising air and the vortex motion very low pressure occurs in the central axis and cold air with the fatty acids. In addition the from above descends; but the mercexformation of 'fur' or scale in boilers
and kettles by deposition of insoluble ment in the upper portion would cause cloud formation. Cloud, in fact, forms most of the system, and a cloud burst on land is the counterpart of the W. at sea. Torrents of water, rather than rain, result. Fish and frogs have been carried inland by

such phenomena. Water Supply, in a scientific sense, is a problem connected only with towns or closely populated regions. Rural supply.—In sparsely populated and undeveloped regions, natural sources such as springs or streams are relied on, and purity is sufficiently assured, except when storage is necessary on account of recurring drought. To save portage wells have always been and still are in common use. These may be classified as dipping and draw wells in the majority of cases, and it may be noted that they are the most dangerous, as well as containing the hardest water. If the water-table lies at a fair depth from the surface they may be looked upon as stores of filtered water. They are obviously open to pollution from surface water oil manured lands and other sources: organic matter, ammonia, nitrates, chlorium, and even nitrites are com-mon impurities. Draw wells may be considered to reach a depth of 20 ft. Both types are to be condemned as Bruun-Löwener system supplies hard | drawing their water from surface areas overlying impervious strata. wells are those containing water from below such strata, and usually from a distance. They may be quite satismovement also controls valves which factory, particularly if properly enclosed at the surface and drawn by means of a pump. Artesian wells form one of the best sources of supply and in the colonies as well as in towns in the old countries they are becoming much more numerous. Such waters are obtained from a great distance, usually upland, and below several layers of impervious strata; they are therefore of great purity except when brackish or salt or warm. They are, however, free from organic matter, though the water is often objectionfrom the water surface to meet by a though the water is often objection-prolongation of its apex a similar but ably hard. A surface well properly inverted cone of cloud. The cylindri-excavated, lined, and fitted with a pump may cost from £10 to £16: a deep well of a simple and easily bored type (100 ft.) about £50; the latter might supply a population of 150 to 200. Artesian wells are extremely variable in cost and supply. It may here be noted that the Rivers Pollution Commissioners classify drinking

1. According to palatability and wholesomeness :-Spring water very palatable Wholesome Deep well water 3. Upland surface water moderately palatable 4. Stored rain water 5. Surface water from culti-vated land Suspicions 6. River water to which sewpalatable age gains access Dangerous 7. Shallow well water

2. According to softness:

1. Rain water

2. Upland surface water

Surface water from cultivated land

Polluted river water.

Spring water

Deep well water 7. Shallow well water

Properly collected and filtered rain no supply is available. The distribuwater may be considered good, but tion of water in the strata of England

 Hand labour at 18s. per week

2. Horse power, man at 18s. per week

Gas engine and pump (gas 4s. per 1000)

4. Small steam pump and boiler (coal £1 per ton) 5. Oil engine and pump (oil

7d. per gall.)

6. Electrically driven pump in connection with large

steam plant for lighting 0.45 tensive and uneven larger provision than that of wells is necessary. The Cheaper than any of these comes the water may be taken by means of American type of windmill, but pumps from a river near by, or obaddition. The hydraulic ram is above the highest part of the supply largely in use for supplying water pipes. Such a tower maintains a from streams and ponds; it is autoconstant 'head' of water and gives matic, durable, and extremely ecopressure if the pumps are internomical. In England the water supply mittently worked; a reservoir may be of rural districts is regulated by the constructed at such a height for Public Health Act, 1875, and the storage and pressure. Such arrange-Public Health Water Act, 1875, the ments are becoming less common, supply being under the authority of reliance being placed entirely on the rural sanitary authority, who pumping. Gravilation may be used have very full powers including that for eviving pressure when the water is the rural sanitary authority, who pumping. Gravitation may be used have very full powers, including that for giving pressure when the water is of declaring a house unfit to habit if drawn from upland surface regions,

water may be considered good, but the strata of England the precautions are naturally numer may be generalised as follows: The ous and not often observed. It is imclays, gault, Upper Lias, and New Red portant, if obtained from roofs, that the first washings of rain should not be collected in the tank, and in any case the barrel form of storage should not be used.

The cost of pumping 1000 gallons of water in the strata of England they generalised as follows: The cost of pumping 1000 gallons of water in the strata of England they generalised as follows: The cost of pumping 1000 gallons of tains iron, but good supplies are obtained from the Reading Beds and Daratively shown as follows:

The cost of pumping 1000 gallons of tains iron, but good supplies are obtained from the Reading Beds and Thanet sands. Chalk, Upper and tayout Corporated and Code a precipilly the content of the co

Water

Thanet sands. Chalk. Upper and Lower Greensand, afford a practically d. unlimited supply of good, pure, but 26.5 hard water, which applies also to

calcareous grit, collites, magnesian 4-20 limestone, and mountain limestone.

Good supplies are obtained from Portland rock, Middle Lias, New Red Sandstone, Old Red Sandstone, slate, 1.14

and granite. Millstone Grit gives ex-0.75 cellent water in abundance; the coal measures abundance, but often of

0.70 bad quality. Town Supply .- When the supply required is large and the district ex-

arrangement for storage is generally tained from a distance, usually an up-a somewhat added cost. Where pipes land surface region. In such cases a somewhat added cost. Where pipes iand surface region. In such cases lead from the pump to tanks, the provision must be made for pressure former should be of east iron, with in order to supply not only the upper spirot and socket ends and joints of stories of houses, but also houses situyarn and blue lead; tanks are usually ated on elevated sites. This may be of east or wrought iron and galvanised, developed by force pumps which but special paint should be applied in supply water to a tower situated addition. The hydraulic ram is above the highest part of the supply larged in the force supplying water pipes. Such a tower maintains a

storage tanks being arranged in the | six months is generally made. Accoun course of the system at convenient and sufficient heights. In such a system, such as is being adopted steadily by larger industrial areas c.g. Liverpool from Lake Vyrnwy; Manchester from Longderdale valley and Lake Thirlmere; Glasgow from Loch Katrine—water is brought in open aqueducts, tunnels, and pipes from the gathering ground where it is stored in large reservoirs, usually from rivers the habit of the stream constructed by building a dam across a valley. Along the course compensation water is given out to streams whose head supplies have been tapped. On nearing the town, a high-level reservoir is generally constructed, from which the water is drawn through the filter beds to the covered clear water tank which feeds the supply pipes direct. The water may be at great pressure when brought from mountains to the coastal plain, and in low-lying districts it might necessitate the unconomical use of stronger pipes. To obviate this a necessitate the uncomment use of stronger pipes. To obviate this a special 'break' reservoir at a convenient height may be fed, which gives its water at less pressure. Subsidiary supplies may also be drawn from other sources near at hand. Quantifies.—The amount of water serviced is estimated in gullars are required is estimated in gallons per head per day; in England it is found to be anything from 20 to 50; in America somewhat more. Mr. Freeman of New York estimates 31 to 56 gallons used, 10 unavoidably wasted, and from 50 to 75 avoidably wasted. and 192 wasted. The waste may be due to leakage for the most part. The amount used, of course, varies with the time of day and with the season. The uses may be summed up as follows: Drinking (first, because it necessitates the great expense of purification), sanitation and washing, street and garden watering and fire extinguishing; power, though account of great expense factories usually instal their own supply. The their fluctuations, amounts and together with good provisions for increased population, extended area, and increased use, necessitates careful estimation in all parts, pumping machinery, reservoirs, diameters of pipes, etc. They are of prime importance in deciding the area of collection at the head. Rainfall .- Not only is this to be measured regularly for average and for drought, but it must be traced in its distribution. The discharge of streams, loss by evaporation, and by underground drainage tion, and by underground arainage saind is simply a mechanical support are in England, and collecting area for the impuriace to the superstance of the superstance of

must be taken of compensation water claimed by factories, riparian owners etc., and reckoned usually at one third the discharge of the stream This is arranged definitely when powers are obtained from parliament and sometimes necessitates the con struction of special reservoirs, no always a disadvantage for they take flood-waters. When water is obtained must be studied.

Intakes.—Valve towers are erected in reservoirs and lakes; in the case of rivers, the supply may be brought by a parallel channel from upper reaches to a lateral reservoir; more often tunnels are built in a masonry wall, which lead to the reservoir; sometimes a natural or artificial portion of the bank forms a first filter bed, the water being allowed to percolate through. If the head waters are collected at numerous springs, they are usually enclosed and connected by pipes to a reservoir or well whence the water flows into the pipes. When water is pumped from a river, the times are chosen when the water is at its best.

Conduits, Pipes, etc.—The former are preferably used, unless the volume is too small to justify expense, and they are usually open. Tunnels are used when, for any reason, purity may be endangered. Pipes are resorted to for straighter course, or when the level becomes low and pressure greater, as when a valley is cro-sed, or when a break in the gradient is advisable.

Purification.—The waters having been collected they must be freed from impurities both inorganic and For the former sedimentaorganic. tion is relied on chiefly, and when too hard, the process of softening takes place at the same time, the necessary quantity of calcium and sodium carbonato being run in. This is usually carried out in separate reservoirs or beds of shallower proportions, and divided into portions which may be used in rotation. Much organic used in rotation. matter is carried down, and with it bacteria, the process of filtration being partly relieved. The filter beds are contained in water-tight tanks with drainage channels leading from gratings in the floor. To prevent clogging these gratings are covered with heaps of gravel and fine sand laid level over all. Water is run in slowly and per-

colates through, the organic matter forming a slime on the surface. The sand is simply a mechanical support

2 or 3 ft. above the sand, their activity, water supply as a tradifig concern is greater. It is the layer in which they are active that forms the real filter. Asthis becomes clogged another bed is brought into use, and the sand scraped off the surface to be used again after drying and aerating. Filtering is allowed to proceed as slowly as possible, but the rate is contingent on the area available and the demand for water. The reduction in organism in the case of filtering of Thames waters amounts to 97.7 on the average, depending on the thickness of the sand layer and slowness of the process. In America, aluminium sulphate is often added, the effect of which is to aid coagulation of the organic slime, and the water is then forced through the beds at a greatly increased rate, but the resultant water is less free from bacteria. In some cases again the sand bed is given a prolonged life by covering with coarse gravel, so as to lessen also the time of recovery; filtration being no better. From the filter beds the water proceeds to the clear water tanks from which it is passed into the mains. These are of stone, brick, or concrete, and often covered, when there is danger of contamination from dust. smoke, and fumes of towns. The roof is usually of iron supported on Ventilation is arranged and pillars. with copper gauze as a strainer. Distribution.—There is no rule for arranging the diameter of mains and pipes, beyond the one that they have to carry a day's supply practically during 8 to 12 hours of daylight. The water is distributed through a system terminating in the leaden pipes within the houses. Along the course are placed air valves, where air is likely to accumulate owing to bends, scour valves for cleaning purposes, stop valves, reducing valves, the hydrants for use in street-watering and in case of fire, the waste water meters, and trade supply meters. Scouring is per-formed by opening the scour valves and allowing the water under pres-sure to waste. The mains and street pipes are laid well below the surface where they are free from summer heat and winter frost, as well as from damage by heavy traffic. Leakage, however, accounts for some 6 per cent.

(see MUNICIPAL TRADE). The question of water supply in many countries is largely connected with IRRIGATION (q.v.), and the steady development of water power for producing electrical energy. See also RESERVOIRS, RIVERS,

Sewage, Pumps, Rainfall.

See Burton, Water Supply. 1898;

J. Tillmans, Water Purification and Sewage Disposal, 1913; C. Herschel, reprint trans. and notes of The Two Books on the Water Supply of the City of Rome of Sextus Julius Frontinus, ed. 1913; C. J. R. Maclean, Rural Water Supplies; Merryweather and Sons, Water Supply to Estates and Villages.

Compartments,

Water-tight SHIPBUILDING.

Watertown: 1. A tn. of Middlesex co., Massachusetts, U.S.A., on Charles R., residential suburb of Boston, 6 m. W. There is a national arsenal; manufs. include rubber, paper, woollen goods, stoves, starch, and horses and cattle are reared. W. was founded about 1630, since when much of its territory has been absorbed by Cambridge. Pop. (1910) 12,875. See Hist. Sketch of Waterlown by Francis Hist. Sketch of Waterourn by Francis (1830), Whitney (1906). 2. City of Dodge and Jefferson counties, Wisconsin, U.S.A., on Rock R., 44 m. W.N.W. of Milwaukee. The North-western (Lutheran) University (1865) and the Sacred Heart (Roman Catholic) pillars. Ventilation is arranged and (Lutheran) University (1865) and the the means of cleansing. To prevent Sacred Heart (Roman Catholic) heating during the day and in Sacred Heart (Roman Catholic) heating during the day and in College (1872) are here. Dairy and summer, clay foundations are placed apiary supplies, flour, machinery, and the side, the whole being covered with S829. 3. Cap. of Codington co., S. earth. The size of the service reserving demand. As in the case of the interest, and the case of the district; has breweries, grain ware-inlet valve and the reservoirs the outlet houses, lumber interests, and manufs. pipe of the service reservoir is covered agricultural implements. Pop. (1910) with copper gauze as a strainer. 7010. 4. Cap. of Jefferson co., New York, U.S.A., on Black R., 47 m. from arranging the diameter of mains and Oswego. It has a state armoury, and manufs. of paper, wood-pulp, steam-engines, vehicles, cheese, and other farm and dairy produce. Pop. (1910)

Jarm and dairy produce. For Array 26,730.

Waterville, a tn. of Kennebec co., Maine, U.S.A., on the Kennebec, 17 m. N.N.E. of Augusta. Fine waterpower is supplied by the Ticonic Falls. Colby Baptist College (Waterville College, 1820) and the Coburn Classical Institute are here. Cottons, machinery maper and woollens, machinery, paper, and furniture are manufactured. Pop.

(1910) 11,458. Water Violet, an aquatic plant of the genus Hollonia (order Primulaceæ). It bears whorls of purplish or yellow flowers, resembling the stock gillyflower once called 'violet,' and pinnatifid leaves. It is also called feather-foil or waterof the local water supplied. Many feather. H. palustris is the kind com-large towns are taking over their monly found in ponds.

Waterviet, a tn. of Albany co., New the Royal Scottish Academy was York, U.S.A., on Hudson R., opposite founded in 1826, he was elected its Troy. It contains an arsenal covering first president. Many of his ablest over 100 acres, the great national gun factory, car works, foundries, etc. Woollens and hardware are among the manufs. It was called West Troy till 1897. Pop. (1910) 15,074.

till 1897. Pop. (1910) 15,073.

Watford, a par. and market tn. of Hertfordshire, England, on the Colne, 15 m. N.W. of London. Papermaking, brewing, malting, and watercress cultivation are carried on. It contains almshouses (1873), the London Orphan Asylum (1871), and a library and school of art (1874).

Aldenham 2 m distant, has an im-Aldenham, 2 m. distant, has an important grammar school (founded 1599). Pop. (1911) 40,953.

Wath-upon-Dearne, a tn. of W. Riding of Yorkshire, England, 6 m. from Rotherham, on the Midland Railway. There are coal mines and breweries, soap, oil, and glass-bottle manufactories. Pop. (1911) 11,830. Watkin, Sir Edward William, first

Baron (1880) (1819-1901), an English railway manager, secretary to the Trent Valley Railway (1845), later absorbed by the London and North-Western C

the Manch the South and the aimed at route with a frequent service of

under one management from : and the S. coast to the N. of En. W. went to Canada in 1861; was M.P. addressed to

Hythe (1874-95).

Watling (Watling's) Island, one of the Bahamas, British W. Indies, now generally identified with the native Guanahani, 50 m. from Cat Is. Hero Columbus landed (1492) on his way to America, naming the island San Salvador. Pop. 5080. See Proc. Salvador. Pop. 5080. See Proc. R. G. S., 1892.
Watling Street (Wacclinga Stract), one of the old R

Britain. It ran fr Canterbury to Lo past St. Alban's

Lane, still bears this name.

Watson, George (1767-1837), Scottish portrait painter. He studied art under Reynolds, and afterwards Here his settled in Edinburgh. eminent gifts were rather shadowed by those of his great contemporary, Raeburn, yet W.'s popularity as a man is evinced by the fact that when Edinburgh. He was trained for the

works are in the National Gallery of Scotland.

Watson, John (1850-1907), an English minister and novelist, known as 'Ian Maclaren.' He was born at Manningtree in Essex, and became minister of Free St. Matthew's, Glasgow, and of Selton Park, Liverpool. He was very successful as a writer, and his descriptions of Scottish. life delighted the public. His most amous works were: Beside the Bonnte Brier Bush, 1894, and The Daps of Auld Lang Sync. 1895. See Life by Robertson Nicoli, 1908. Watson, Sir Patrick Horon (1832-1907), a Scottish surgeon, born at Edinburgh. He served as surgeon in

Edinburgh. He served as surgeon in the Crimean War; became lecturer on clinical surgery at Edinburgh; assistant in 1860, and full surgeon in 1863, at the Royal Infirmary. He was knighted in 1903. He published: Modern Pathology, 1861; Excision of the Knee Joint, 1867; and Excision of

the Thyroid Gland, 1873.

Watson, Richard (1737-1816), an English bishop and controversialist. born at Heversham, Westmorland. He became professor of chemistry (1764) and of divinity (1771) at Cambridge, rector of Somersham (1771), bridge, rector of Herman (1771), and Bishop

He wrote: Apology in a series of letters

went to Canada in 1861; was M.P. laddressed to Gibbon, 1776, and Stockport (1864-68) and for Apology for the Bible, 1796. See his he (1874-95).

Autobiography, edited by his son. 1817.

Watson, Robert (1746-1838), a Scottish adventurer, born in Elgin. According to his own account he rose to the rank of colonel under Washington in America. In England he openly sympathised with the French revolutionaries and was imprisoned (1796-98). He fled to France (1798)

and became tutor to Napoleon. Later taught English in Rome (1816-19), here he bought the Stuart Papers in He finally committed suicide 417.

past St. Alban's

boundary between Leicestershire and
Warwickshire to Wroxeter on the
Sovern, and perhaps on to Chester.
Branch-roads were added later, and
it is often confused with the Great
North Road to York. The road in
London, crossed by Bread Street, with
Watling Tavern at the corner of Bow
Watson, Thomas (c. 1557-92), an
Petrarch's Sonnets, of Sophocles'
In Infogene, and of Tasso's Aminta
before 1585. In 1582 appeared life
Watson, George (1767-1837), a
Committee Street, with
Watson, Thomas (c. 1567-92), and
Watson, other works include: Melibrus, 1590, and Teares of Fansic, 1593. See edition of his poems by Edward Arber, 1870.

traiture, of which he became the Despite his premature death, leading painter in Scotland. He painted most of the Scottish celebrities of his time, including Sir Walter Scott, and also many distinguished Englishmen, e.g., David Cox. He became R.A. in 1851.

Watt, the practical unit of elec-trical power, and the power obtained when a current of 1 ampère is conveyed through a difference of potential of 1 volt. The number of ment for measuring electrical power.

is equal to 10 ergs per second and 746 watts=1 horse-power.
Watt, James (1736-1819), an engineer, born at Greenock. A delicate child, he made small progress until the age of thirteen, when he entered upon the study of geometry with great interest. He also showed great the progress of the study of geometry with great interest. manual dexterity, and after serving under a London mathematical instrument maker became mathematical instrument maker to Glasgow University in 1757. He was employed on surveys for the Forth and Clyde Canel (1767), as well as for the Caledonian and other canals, and he also had to do with the deepening of various rivers, including the Forth and Clyde, and with the improve-ment of the harbours of Ayr, Port Glaszow, and Greenock. He had Glasgow, and Greenock. He had already begun to think about steam an easy begun to think about steam it parallel to the plane of the fixed as a motive force, and in 1764, while coil. The amount of this turning is repairing a model of John New proportional to the number of watte, comen's steam engine, discovered the this amount being read from the cause of its waste of power. He, graduation marks on the torsion head, therefore, in 1765 devised the sepa- Watts, George Frederick (1817rate condenser to obviate the defect, and in 1769 patented his 'Watt' steam-engine, which was manufactured at the Soho Ironworks, W. having entered into partnership with Boulton of Soho near Birmingham. Between 1781 and 1785 he obtained patents for the sun and planet motion, the expansive principle, the double engine, the parallel motion, and a fuel-saving furnace. He also invented copying-ink and discovered independently the composition of water.

Watteau, Antoine (1684-1721), a French painter, born at Valenciennes, He went to Paris in 1702, and after

army, but abandoned a military enduring much privation he was career for art. He studied exclusively eventually recognised, being made a in Scotland, and in 1808 produced a member of the French Academy in scene from the Lay of the Last Minstrel for the first public exhibition following year. Already, however, held in Edinburgh. This he followed the state of his lungs was giving him by various historical and religious grave cause for alarm, and he died pictures, but he soon turned to por- of consumption at Nogent-sur-Marne. He exercised a profound and lasting influence on French art, and left a great number of pictures behind him. Many of them are now in the Louvre, and others are in the Wallace Gallery, while nearly all his work was reproduced in Watson's Bay, a popular resort in New South Wales, on the shore of by his friend, Jean de Jullienne. This Port Jackson, 7 m. E.N.E. of Sydney. book is exceedingly rare, but a good Pop. about 1500. by his history, feeling rare, but a good account of W. will be found in L'Art du 18me Siècle, by E. and J. de Goncourt (Paris), 1860.

Wattle, see ACACIA.

Wattmeter, an electrical instruwatts is obtained from the products. The power or the rate of doing work of the number of volts and ampères in a circuit is equal to the product of of the number of volts and amperes in a circuit is equal to the product of operating. Thus watts=E>C. It the pressure and the current. A good is equal to 10 ergs per second and type of this instrument is that due 746 watts=I horse-power.

Watt, James (1736-1819), an endof a fixed coil and a movable coil. of a fixed con and a movane con, each coil having a separate pair of terminals. The movable coil is suspended by a silk thread, and its movements are controlled by a spring which is attached to a torsion head. The fixed coil consists of a few turns of thick wire, while the suspended coil is made up of very fine wire wound on a non-metallic frame. fixed coil is joined in series with the main current and the suspended coil is joined in the circuit in which the power is to be measured, and hence is traversed by a current proportional to the pressure. The normal position of the movable coil is at right angles to the plane of the fixed coil. passage of the current tends to rotate it parallel to the plane of the fixed coil. The amount of this turning is

1904), a painter and sculptor, born in London. He studied art in the studio of William Belines, the sculptor, and also at the Royal Academy schools. In 1843, when several prizes were offered for cartoons to decorate the Houses of Parliament, W. competed and won £300; and, resolving to spend the money on travel, he proceeded to France and Italy. Returning to England in 1847, he became a Poyal Academician Royal Academician twenty years later; while in 1902 he was made a member of the newly instituted Order of Merit, and died in London. There are pictures from his hand in the Tate Gallery and the National Portrait Gallery, and there is likewise a permanent exhibition of them at Limnersleax, Surrey; while as regards his statuary, his 'Physical Energy' is in Kensington Gardens, By 1880 he had, however, stifficently recovered to resume his religiously by the limit benefit of Tanayasan is at recovered to resume his religiously and the research his religiously and there is likewise a was elected to the London School permanent exhibition of them at Board for Greenwich, but had the religiously and there is likewise a was elected to the London School permanent exhibition of them at Board for Greenwich, but had the religiously and Energy' is in Kensington Gardens, and his full-length of Tennyson is at Lincoln. See George Frederick Walts, by M. S. Watts, 1912, and Rev. Hugh Macmillan's work, 1906, Watts, Isaac (1674-1748), a writer

of hymns, born at Southampton. In 1702 he succeeded to the pastorate at Mark Lane Chapel, becoming very eminent as a preacher, but he had to retire in 1712 owing to ill-health. He was the author of 600 hymns, including 'O God. our help in ages past' and 'Jesus shall reign where'er the sun,' besides Horze Lurica, religious poems; Divine Songs, hymns for children; and a selection of metrical Psalms of David.

Arian tendency. His collected works (6 vols.) appeared in 1753.

Watts-Dunton, Walter Theodore (b. 1832), an English poet and critic, born at St. Ives, Huntingdonshire. He was critic of the Athenoum (1875-98), and contributed articles Rossetti and other poets to the Ency. Brit. He was a life-long friend of A. C. Swinburne (q.v.). Among his publications are The Coming of Lorc, 1897; Aulwin, a poetic romance, 1898; editions of Borrow with introductions; The Work of Cecil Rhodes, 1907; Studies of Shakespeare, 1910; and numerous introductory essays in the World's Classics series.

Wauchope, Andrew Gilbert (1846-99), a British general, born in Midlothian. He entered the navy (1859), but obtained a commission in the army (1865). He served in the army (1865). He served in the Ashanti War (1873), was in charge of

Papho, Cyj Egypt (188 in the Nile

the re-conques (1898). He became major-general in Brigade under General Lord Methuen in the Transvaal (1899), and fell at

Angusa panantaropist, born at Settle, Yorkshire. Having studied at Airedale College, Bradford, for the Congregational ministry, he became pastor at Newbury (1865), at Greenwich (1866-85), and at New Southgate (1885-87), in which latter year he retired to devote himself outlied; to retired to devote himself entirely to his philanthropic work. He was especially interested in neglected and ill-treated children, and with John the most familiar kind of waves. In Macgregor founded an institution for the care of vagrant boys. In 1870 he water wave consists of a motion

recovered to resume his philanthropic labours, and founded in 1884, with Miss S. Smith, the London Society for the Prevention of Cruelty to Children. This was incorporated by royal charter in 1895 as the National Society for the Prevention of Crucky to Children, after which date until 1905 W. acted as director. He published The Children's Sunday Hour; W. T. Stead: a Life for the People; Hymns for Children: The Child of Nazareth, 1906; The Gaol Cradle: ncho rocks il? and edited the Sunday Magazine, 1874-96. Waugh, Edwin (1817-90), the Lan-

cashire poet, born at Rochdale. He had but little schooling, but being apprenticed to a bookseller and printer he found opportunities for reading and became especially interested in the histories of his native country. Thus he learned the literary use that could be made of the Lan-cashire dialect, and in 1859 won the hearts of his countrymen by his Lancashire Songs. He also published sketches of Lancashire life and scenery, including Factory Folk during the Cotton Famine, The Chimney Corner, Tufts of Heather, Rambles in the Lake Country, and the Besom Ben

Stories.

Waukegan, a city, Lake co., Illinois, U.S.A., on the W. shore of Lake Michigan, 36 m. W. by N. of Chicago by rail, is a health resort with valuable mineral springs. Pop. (1910) 16,069.

Waukesha, a tn., Waukesha co., Wisconsin, U.S.A., 15 m. W. of Milwaukee, is a popular watering-place with the celebrated Bethesda medicinal springs, the water of which forms a valuable export: there are extensive lime quarres. Pop. (1910)

He became major-general in Commanded the Highland Recueil des croniques et unciennes

ich em. t settle-

Waugh, Benjamin (1839-1909), an ment of Britain to 1411. It was English philanthropist, born at Settle, edited by W. and E. Hardy (1864-91) for the Rolls series, and vols. I.-lif. translated.

Wausau, a city, cap. of Marathon co., Wisconsin, U.S.A., on the Wis-consin R., 160 m. K.W. of Milwauker, is a centre of the lumber trade, and has numerous manufactures. Pop. (1910) 16,560.

Wave, The ripples on water are

must have the capacity of restoring conclusion that it has great rigidity itself to its normal state. In the case or a very small density, as revealed of water, ripples may be started by dropping a stone into the water; this disturbs the normal state of the water, the capacity or recovery being found in the action of gravity, or in surface tension, or in the two combined. Large waves are affected chiefly by gravity and are called gravitational waves, whereas ripples. or small waves, are due chiefly to surface tension. The term were has a surface tension. The term and has a wider significance than that indicated. From the point of view of the physicist, if the various particles of any material system are executing periodic. motions, the resultant motion of the medium is termed a wave-motion. A simple instance is the piston of a steam-engine: it excites a periodic motion in that it travels back and fore in a definite constant time. this motion is represented graphically it takes the form of a wave, and the motion is treated as a wave-motion. All material substances have some degree of elasticity, and any molecur-lar disturbance which takes place in the body will be propagated through the body in virtue of this elasticity. Elasticity may appear in two different forms, such as the resistance offered to change of bulk and the resistance offered to change of shape. The former is called bulk elasticity or degree of incompressibility, and the decree of incompressibility, and the latter rigidity. In gases and most legium, 16 m. S.E. of Brussels. The liquids, such as water, the resistance desperate battle fought here (June 18, of these fluids is due to this type of loo. Pop. 8500. lasticity. Such waves are called Wax, the name given to various longitudinal, and consists of periodic animal, vegetable, and mineral subvariations of density in the medium, stances, which resemble beeswax in This is the case in the propagation of having a peculiarlustre. We resemble sound. Sound is a wave-motion in the fats in that they are lighter than air, and its velocity is given by the water melt on heating, and burn

which passes along the surface with a definite velocity. The individual particles of the water execute an up and down motion solely, and thus give rise to the wave form which is propagated along the surface. Waves differ in many ways, such as their respective lengths. i.e. the distance between consecutive crests; their periods, i.e. the time an individual particle takes to perform a complete up and down motion, and also in their form. The terms wave-length and period should be thoroughly understood. The wave-length has been defined above, but in connection with a wave-motion itself the period is defined as the time which the wave takes to move through its own length. To generate waves some disturbance is necessary, also the disturbed medium wave, have the capacity of restoring the surface of a longitudinal wave, and so the either is assumed to be incompressible. The high velocity of light must lead to the convention that it has great rigidity. or a very small density, as revealed

by the Newtonian formula $v^2 = \frac{E}{d}$. Hertz has demonstrated the exist-ence of electric waves which are similar disturbances in the ether, and also the existence of heat waves has been shown, all these waves travelling with the same velocity. These waves are treated as transverse vibrations in the other, the difference be-tween them being found in their wave-lengths. Periodic events are the most frequent in the life of nature, e.g. the rotation of the earth, the ree.g. the rotation of the earth, the recurrence of the seasons, the tidal waves, etc., and these may be represented graphically in wave form. See 'Water Waves,' in Lamb's Hydrodynamics, 1895; 'Wave-motion and Sound Waves,' in Wa'-on's Physics, 1907; 'Electric Waves,' in Maxweil's Electricity and Magnetism, 1892; 'Ether Waves,' in Larmor's Matter and Ether, 1900

and Ether, 1900. Waveney, a riv. of England, rises near the Little Ouse and forms part of the boundary between Norfolk and Suffolk. After a course of nearly 50 m. it joins the Yare 4 m. S.W. of Great Yarmouth.

Waverley, a tn., New South Wales, an E. suburb of Sydney, has a beautiful burial-ground. Pop. 12,500.

liquids, such as water, the resistance desperate battle fought here (June 18, to change of bulk is the only one 1815) between the Prussians and the which exists, and any propagation French, under Grouchy, prevented which takes place through the medium the latter joining Napoleon at Water-

turpentine, but are insoluble in water! and cold alcohol, and differ from true fats in that they do not yield glycerine when boiled with alkalies. Beeswax, the most commonly known W., is secreted by bees, and is obtained by heating the 'honeycombs' in water, when the W. rises to the surface. In the crude state this W. is of impure yellow colour, has a melting point of 63° C. and a sp. gr. of 0.96. It contains 12-15 per cent. cerotic acid and some 80-85 per cent. of myricin or myricyl palmitate. For candle mating the W. is bleached in the sun after treatment with acid. The W. is also used for waxing floors, for making varnishes and lithographic crayons. Chinese W., which is used for candle-making in Japan and China, is produced by an insect (Coccus ceriferous), and consists chiefly of ceryl cerotate. Japan W. is obtained from the seeds of a species of Rhus (R. succedanea). It consists mainly of palmitin, is green when raw, and is bleached in the sun for use in castor oil pomades. Myrtle berry W. is another vegetable W. made from the plant Myrica cerifera. Palm W., or Carnauba W., is produced from the leaves of the W. palm of Brazil (Corypha cerifera) and the Andes (Ceroxylon andicola). The W. is found on the leaves of the palm, and these are cut and dried in the sun. The W. is then obtained as a fine powder, when the leaves are shaken. Spermaceti (q.v.) is a W. obtained from the head of the sperm whale. As an example of a mineral W., ozokerite (q.r.) may be mentioned. The most important mineral W. is paraffin W. It is obtained by distillation of petroleum or oil shales, and is used for candle-making, as largely insulating material, in laundries with starch, for waterproofing textiles, and for making pomades and polishes. See Candles, Spermaceti. Ozoker-ITE, etc.

Waxahachio, cap. of Ellis co., Texas, U.S.A., 30 m. S.W. of Dallas; has a Methodist College. Pop. (1910)

6205.

Wax-Myrtle, see CANDLEBERRY. Wax Palm, see WAX.

or Amyloid Waxy Degeneration, Degeneration, a condition characterised by the formation of an albuwax. It

and is the bone disease, syphilis, rheumanni, etc. The organs mainly affected by etc. The organs mainly affected by amyloid degeneration are the liver, spleen, kidneys, and lymph glands. The condition is probably brought about by the continued action of taxout by the continued action of t

They are soluble in ether and the tissues, altering their constitution until they combine with substances brought by the blood or lymph. The amyloid substance is a homogeneous translucent mass, resembling wax in its lustre and behaviour under the knife. It gives a brown colour when treated with iodine.

Way, Right of, see Right of Wat. Wayeross, a co. seat of Ware co., Georgia, U.S.A., 96 m. S.W. of Savannah, is the centre of a cotton and sugar growing district, and has saw and planing mills and machine

shops. Pop. (1910) 14,485, Wayne, Anthony (1745-96), American general, called 'Mad Anthony' for his reckless courage, was born at Easttown, Pennsylvania. He raised a regiment of volunteers (1776). and was sent, as its colonel, to Canada. He was in command at Ticonderoga until 1777; fought at Brandywine, Germantown, Forge, Monmouth, and Paoll. His most famous exploit was the carrying of Stoney Point (July 15, 1779). He aided Lafayette in Virginia (1781), and took part in the siege of York: Appointed general-in-chief town. he made an advantageous treaty with the Indians (1795).

Waynesboro, a bor. in Franklin co., Pennsylvania, U.S.A., 14 m. S.E. of Chambersburg, manufactures engines and machines, pottery, flour, and lumber products, and is the centre of an agricultural region. Pop. (1910)

7199.

Ways and Means, Committee of. At the close of the debute on the

self into a C. of

o consider the ways and means of raising the sumrequired for the ensuing year's estimates, a

by the duties o thorise c fund and '

Wazan, or Wezzan, a holy city and the residence of the Grand Shercef, or spiritual ruler of Morocco, 53 m. N. of Fez. Pop. (estimated) 10,000.

Wazirabad, a tn., dist. of Gujran-wala, Punjab, India, 60 m N. by W. of Lahore, manufactures from and steel goods. The Alexandra railway bridge, one mile distant, spans the

ortage, one mno assume, spans the Chenab R., and was opened in 1876 by the Prince of Wules, Pop. 18,000, Weald, or Woodland, of Kent and Sussex, the area lying between the North and South Downs. In this area

land, adjoins Ha Pop. (1911) 11,923.

and consequently is in itself the basis and hardly deserves its excessive or subject of the whole science of political economy. In common parlance W. is regarded as merely a synonym for an individual's sum total of worldly possessions, but placed in a ship's port to keep out the political economy, as its name implies, takes account more or less of some of the most widely accepted and rational principles of government. W. and money are far from being identical terms; the converse assumption was once, however, acted upon to the extent of placing artificial restraints upon commerce, so as to WeatherForecast. Since the inventors tion was once, however, acted upon to the extent of placing artificial restraints upon commerce, so as to prevent precious metals from being sent out of the country. As Mrs. forecasting of weather has been atfacted but the introduction of the barometer, the scientific forecasting of weather has been atfacted but the introduction of the mistook the sign for the thing signified (see on this Capital, Conventional language of political conomy, the three requisites of the production of W. are Land, Labour, and Capital. Labour in the above context necessarily excludes all labour that is not either 'directly 'or 'indirectly productive,' i.e. labour which does not increase the collective material W. of the community as opposed to that of a class of persons only. The phrase 'exchange of weather formed by Glaisher into a material W. of the community as opposed to that of a class of persons only. The phrase 'exchange of weather formed by Glaisher into a washington, was at work on the same lines about the same time. In Europe weather formed by individuals and classes. Hence if the institution of private prevent. but by individuals and classes. Hence if the institution of private property were ever destroyed the phrase 'exchange of wealth' would have no meaning, as also the various economic. laws relative to the distribution of W. among certain classes and persons. W. is divided into rent, wages, and profits, or in other words, is distributed among those who are the pro-prietors of the previously mentioned agents or requisites of production. In some countries the same persons often own all three agents of production, for instance, wherever peasant proprietorship obtains, but in England, landowners, capitalists, and labourers are for the most part mutually exclusive classes.

Wear, a riv. of England, rises in the Pennine Chain, in the W. of the co. of Durham, and flowing E. past Durham and Chester-le-Street enters

Wealdstone, a tn., Middlesex, Eng-reddish-brown above and white nd, adjoins Harrow-on-the-Hill. below. In very cold winters it be-op. (1911) 11,923. Wealth, may be defined as any-thing which has an exchange value, and consequently is in itself the basis and hardly deserves its excessive

it was the great gale which damaged the English and French fleets in the Crimea on Nov. 14, 1854, which called attention to the importance of the matter. Leverrier, in Paris, established an organisation, and the meteorological office, under Admiral Fitzroy, was organised by the English government in 1854. Storm warnings were issued in 1861 to 130 stations round the coast, and daily forecasts issued to the newspapers. The former were signalled from the shore by means of a large black canvas cone to shipping; the upright cone indicated a storm from the N. half of the com-pass, an inverted one, a storm from the S. At night three red lamps outlined the figure; these signals are still used where fishing boats are engaged. In 1879 forecasts were again established after being discontinued in 1866, and in 1881 the modern chart was instituted. The system depends mainly on telegraphic accounts from of Durham, and flowing E. past mainly on telegraphic accounts from the North Scaat Sunderland. Length, 65 m.

Weasel (Musicia vulgaris), a widely distributed carnivore, native of Britain. Its body is about 8 in. long, cularly in the latter case. Observand its tail 2 to 3 in. Its head is small tions are taken at 7 a.m. at stations and flattened, with lively black eyes within a circumference extending and short rounded ears. The fur is from the Azores, through N. Africa to the Black Sea, round through Arch-| most numerous in Africa, but extend

plotting all the information on a

when the isobars and isothern dicate the systems mainly. In U

successful owing to their possessing stations well to the W. whence the weather 'comes. In England it is times make more difficult, but easier to the S. and E. than elsewhere. Complete success is attained in over 50 per cent. of the cases, while 'practical' correctness is found in over 90 per cent. The forecasting for more than 24 hours ahead is attempted by several newspapers for week-ends, but with no success. Continued observations in Polar regions of late years have done much to extend knowledge of world conditions, and though collection of facts is slow, and the interpretation difficult, it does not appear beyond the bounds of probability that 'average weather' will in time be forecasted over seasons. The importance of fore-casting to rated. Sce Forecasting. 19 cather Charts and Storm Warnings; J. S. Fowler and W. Marriott, Cur Weather

(Temple Primers); R. G. K. Lempfert, Weather Science, 1912. Weathering, the result of mechanical and chemical changes produced by the action of atmospheric agencies on

exposed rock surfaces. See DENUDAлĊ.

erm for that side of the carp nation in towards the wind.

Weaver, a riv. of England, rises in S.W. Cheshire and flows S.E. and N. through the salt district to join the Mersey near Runcorn. Length 45 m. Weaver, John (1673-1760), an Eng-

lish dancing master, born at Shrewsbury. He was the original introducer into England of the entertainments called called

reality From

enterprises theatrical London. He sometimes performed in his own productions and published various numerous treatises on dancing, including History of the Mimes and Pantomimes, 1728.

Weaver Birds, or Ploceidæ, a family of passerine birds allied to the

finches, so called on account of their remarkable nests which, in some cases, are immense structures occupied by a colony of birds. They are cated at St. John's College, Cam-

angel to Iceland. Full particulars to Asia and Australia. Most of them from are brightly coloured, particularly in the breeding season. The bodies experience and the established laws of weather science. The most important part of the work consists in

and Germany, forecasting is very nests of the social W. B. (Philaterus socius) have a common roof under which as many as 1000 pairs some-times make their home. Many species are imported to Britain and kept as pets.

Weaving, see Cotton Spinning AND MANUFACTURE, and WOOL.

Web, see GIRDER. Webb, Matthew (1848-83), Captain W., the channel swimmer, was born at Dawley, Shropshire. He was trained for the mercantile marine on the Conway, apprenticed in 1862, becoming mate (1866) and captain (1875).He successfully swam the Channel from Dover to Calais without artificial aid in Aug., 1875, covering about 40 m. in twenty-two hours. He was drowned in an attempt to swim the rapids at the foot of the

Niagara Falls.

Webb, Sidney (b. 1859), an English author, born in London. He is the honorary professor of public admini-stration, London University, and on the board of the School of Economics, and has served on several Royal Commissions. Among his publica-tions are: Socialism in England, 1890; The Eight Hours' Day (with Harold Cox), 1891; London Education, 1904; Grants in Aid, 1911; and in conjunc-tion with his wife Industrial Demo-cracy, 1897; English Local Govern-ment, 1906-8; English Poor Law Policy, 1910; The State and the Doctor, 1910; and The Prevention of Destitution, 1911.

Webb City, a city of Jasper co., Missouri, U.S.A., 160 m. S. of Kansas City by rail, is the centre of a lead and Pop. (1910)

zine mining district. Pop. (1910) 11,817. Webbe, Samuel (1710-1816), an English musical composer, born in Minorca. In 1766 he won a prize offered by the Catch Club of which he became secretary (1791-1812). In 1787 he became Ilbrarian of the Glee He wrote a large number of Club. glees, canons, catches, and part-sours, including When Winds Breathe Soft, Glorious Apollo, and Come, Live with Me, as well as a quantity of church music

Webbe, William Ul. 1568-91), an English critic and author, was edu-

He published A Discourse the Fide of Morality, especially when he refused to support the abolition of slavery on the ground that the Union would be endangered.

Webster, John (c. 1580-c. 1625), a dramatist, the son of a tailor, was in hexameters of Virgil's perfectly the side of morality, especially when he refused to support the abolition of slavery on the ground that the Union would be endangered.

Webster, John (c. 1580-c. 1625), a dramatist, the son of a tailor, was apprenticed to the same craft, and in 1603 was made a freeman of the Meritage. bridge. of English Poetrie (1586) containing much valuable information about contemporary poets, an appreciation contemporary poets, an apparation of Spenser's verse, a protest against 'tinkerly rhyme,' and some translations in hexameters of Virgil's Eclomics. Writers, ix.

Weber, Wilhelm Eduard (1804-91), a German physicist, was born at Wittenberg. He carried on researches in magnetism, acoustics, and electro-dynamics, and in collaboration with his brother he published Die Wellen-

his brother he published Die Wellen-lehre auf Experimente Gegründet, 1825. Webster: 1. A tn. of Worcester co., Massachusetts, U.S.A., 16 m. S. by W. of Worcester, on French R.; has iron and brass foundries, and manufac-tures cotton and woollen goods. Pop. (1910) 11,509. 2. A city of Hamil-ton co., Iowa, U.S.A., 62 m. N. by W. of Des Moines; coal, limestone, and brick-clay are worked, and foundry products manufactured. Pop. (1910) 5208 5208.

Webster, Augusta (1837-94), an English poetess, born at Poole, Dor-setshire. In 1863 she married married In Thomas W. of Trinity College, Cam-Blanche Lisle (1860) and Lilian Gray (1861); Dramatic Studies (1866); Portraits (1870); the poetic dramas, The Auspicious Day (1872); Disguises (1879); In a Day (1882); The Sentence, a tragedy (1887). She also published English verse translations of *The* Prometheus Bound of Æschylus (1866) and the Medca of Euripides (1868). See Miles, Poets and Poetry of the Century (ed. 1905).
Webster, Daniel (1782-1852), a cele-

brated American orator, statesman, and jurist. Began practising at the bar in 1805, at Portsmouth, New Humpshire, and very soon leapt to the front of his profession. Was the front of his profession. Was elected to Congress, 1813, and sat there till 1817, still practising at Boston, where he had purchased an estate. Entered Congress for the second time in 1822; elected to the Senate in 1828, and eight years later unsuccessfully ran for the presidency. In politics he seems first to have used his powerful oratorical gifts on the side of Free Trade, but afterwards espoused the system of Clay (see TARIFF). He was appointed Secretary of State under Harrison, and while holding that c celebrated Oreg

chant Taylors Company. From his pen came historical plays, comedies and nageants. The first play written entirely by himself, and published in 1612, was a tragedy entitled The White Devil, which was shortly followed by Appius and Virginia. His masterpiece was The Duchess of Malf., first performed by the King's Men at Blackfriars in 1616, and frequently revived. W's works were collected in 1830 by Dyce and in 1856 by William Hazlett the Younger. Webster, Noah (1758-1843), an

Webster, Noah (1758-1843), an American lexicographer, born at W. Hartford, Connecticut. life as a schoolmaster and published A Grammatical Institute of the English Language (1783-85), which had an enormous sale. He then began preenormous saie. He then began preparing his famous Dictionary, which appeared in 1828. W. became editor of the Minera (1793) and the Herald and wrote A Brief History of Epidemics (1799), A Philosophical and Practical English Grammar (1807), and

other works.
Webster, Sir Richard Everard, see

ALVERSTONE, LORD.

Weckherlin, Georg Rudolf (1584weekherin, Georg Rudon (1984) 1653), a German poet, born at Stutt-gart. He studied law; became secre-tary to the Duke of Würtemberg (1610-20) and was employed on diplo-matic missions to England, where later he entered the service of Charles I. He published Oden und Gesange 1618) and Geistliche und Weltliche Gedichte (1641). See edition by Fischer (1894-95).

Wedderburn, Alexander, first Baron Loughborough and first Earl of Rosslyn (1733-1805), a distinguished lawyer and statesman, born at Edin-burgh. He was called to the bar, 1754, but left Scotland and came to London. where he became a member of the Inner Temple, 1757. He at first attacked Lord North, but was after-wards made Solicitor-General by him.

In 1778 he became Attorney-General, and 1780-83 Lord Chief Justice of Common Pleas. Wedding Ceremonies, see MARRIAGE

Wedge, a triangular prism used for separating the particles of a body. The edge of the W. is inserted between Ashburton. He and again sat in The edge of the W. is inserted between two parts of the body and pressure is 1850 he again filled the office of a pplied to the base, usually by strokes secretary of State, retaining the post till his death. Was one of the greatest American orators of all time, though he did not always employ his gifts on a direction perpendicular to their axes, chisels, nails, etc.

Wedgwood, Josiah (1730-95). manufacturer of pottery called after born at Burslem e. He worked in name, in Staffordshire. brother's pottery until in 1759 he established his own manufactory, where he produced a cream-coloured porcelain, patented by him in 1763. He executed a table-service for Queen Charlotte (hence its name, Queen's ware) and another for the Czarina of Russia. From 1775 he employed Flaxman, the sculptor, to execute designs and studied to create only the most beautiful and delicate ware. He made some exquisite copies of classical vases, notably of the Portland vasc. He published pamphlets on his art, and his catalogues were translated into many European languages. See Jewett's The Wedgeroods, 1865; Church's Life: and Rathbone's Old Wedgwood, 1893-98.

Wednesda, 1833-36.
Wednese, a vil., Somersetshire,
England, 7 m. W.N.W. of Wells. It
is noted for the treaty (sometimes
called Treaty of Chippenham) concluded here (\$78) between King Alfred and Guthrum the Dane, by which the country N. of Watling Street was ceded to the Danes.

Wednesbury, a municipal and parl. Mercury, Jupiter, Venus, and Saturn. bor. Staffordshire, England, 71 m. The Latin nations have retained the N.W. of Birmingham. There are expanses derived from these delites, but tensive manufs. of iron (boiler pla) bar iron, axles, tools, gunlocks) steel. Coal, iron, and limestone worked in the neighbourhood. I (1911) 28,108.

Wednesday (A.-S. Woden's Day), the fourth week. It was the Dies Merc Romans, whom the Frencl ' calling it Mercredi (Mercu It is regarded by the Per red-letter day,' because ... was created on the fourth day.

Wolverhampton, Staffordshire, En land; has coal mines and manuis. steel traps, locks, and keys.

(1911) 6492. Weed, a name sometimes applied in Scotland to affections of the breast, or, more generally, any sudden illness

in women after Weedon Beck. Street, a par. an shire, England,

magazines. Pop. (1911) 4150. Weeds. The fight with W. may

begin when the ground is dug in winter; perennial W. such as couch, dand dand shepl 1: and out, thrown into a heap, an-

faces. Examples of Ws. are knives, (As fast as annual W. show in spring they should be hoed up into the sun; this should be continued through the summer. The last crop of annual W., which has no time to seed, may be

dug in as green manure. Weehawken, a township, Hudson co.. New Jersey, U.S.A. on the Hudson R., 2 m. N.N.E. of Hobeken and connected with New York City on the by ferry; is a residential suburb of the

latter. Pop. (1910) 11.228.

Week (A.-S. trien), a period of seven successive days, as in Jewish and Christian calendars, especially such a period beginning with Sunday and including in addition to that day and including in addition to that day Monday, Tuesday, Wednesday, Thursday, Friday, and Saturday. The W. has been in use in Eastern countries from the earliest times, but was not introduced into the Roman calendar till after the reign of Theodosius (4th century A.D.). The names of the days of the W. are derived from the planets, the hours being allotted to the seven planets in the order of their supposed distances from the earth, and each planet being regarded as presiding over the day whose first hour belonged to it. Thus the days of the Roman W. were assigned in order to the sun, the Moon. Mars, Mercury, Jupiter, Venus, and Saturn. The Latin nations have retained the

of Mars, Woden of Mercury, Thor of

JSE. 5 m. N.N.W. the Tugela; ssacre of the by Dingaan. Pop. 1700.

Weeping, an involuntary expression Wednesfield, a par. and suburb of of anguish or of pain. Its chief charobbing, bewailing,

* ars. Among primiraces the weeper often knocks his breast, tears his

hair, and cries out with a loud voice. W. may also be a sign of great joy and of uncontrollable laughter. Excessive W., alternating with helpless laughter, is one of the signs of hysteria.

Weeping Tree, a tree with branches St m. W. of Northampton; has blast of drooping tendency. Varieties of furnaces, barracks, and powder this kind occur in a number of magazines. Pop. (1911) 4150.

Weeds. The fight with W. may poplar, and willow. They are usually

propagated by grafting or by cuttings. Weesp, a com., Holland, prov. of N. Holland, on the Vecht. 61 m.

6701.

Weever, John (1576-1632), an English antiquary and poet, born in Lancashire, educated at Cambridge. Read widely contemporary poets, and in 1599 published Enigrammes in the Oldest Cut and Newest Fashion, with a portrait of the author. In 1601 W. published a second volume of verse, The Mirror of Martyrs, which was possibly inspired by Shakespeare's Henry IV. W. also wrote An Agmus Dei, 1606; Ancient Funerall Monuments, 1631.

Weevils, Plant-eating Beetles, or Curculionidæ, a very large family of beetles of the group Rhyncophora. educated at Cambridge. cashire,

beetles of the group Rhyncophora, of world-wide range. They are of world-wide range. They are characterised by the possession of a distinct beak or snout which is sometimes very long. The larvæ are white, fleshy grubs with wrinkled clin and beat headen and beat and were larger than the statement of the stat skin and bent bodies, and usually have no legs. These and the beetles of many species cause great damage to cultivated plants, while many cause much loss by their destruction of grain. The large brown pine W. (Hylobius abietis) is a serious pest of trimonus aciens) is a serious pest of forest trees, often destroying acres of young conifers, most of the damage being done by the adults, though in most species it is the grubs which are more mischievous. Garden Ws. feed at night and seek shelter during the day, and can be caught by laying sacks on the ground. sacks on the ground.

Sacks on the ground.
Weblath, a tn., prov. of E. Prussia,
Prussia, at the confluence of the Alle
and the Pregel, 42 m. S.W. of Tilsti,
has iron foundries and manufs. of
machinery. Pop. 5300.
Wolda, a tn., Saxe-Weimar, Germany, on the Weida R., 18 m. W. by
N. of Zwickau; has woollen manufs.

Pop. 9300.

Weighing Machine, an adaptation of the steel-yard for the weighing of heavy goods. The greater portion of the weight is indicated by weights placed in a pan at the end of the long arm of the steel-yard, while a travelling poise on the arm serves to indicate the remainder. The power is multiplied some hundreds of times by the steel-yard itself and levers

situated under the weighing platform. Weights and Measures. In order to measure any quantity of length, time, mass, etc., it is necessary first of all to fix on a definite quantity of the same kind and call this the unit of measurement. The unit selected, any other quantity will be measured by the number of units it contains. The concreterepresentation of a unit is termed the 'standard.' In the English, or foot-pound-second system, the unit of length is the foot, a foot being one-

castle; contains the villages of Scaton | third of a yard. The yard is defined Burn and Six Mile Bridge. Pop. (1911) | as the distance between two plugs of gold sunk in a bar of platinum which is kept in the Exchequer offices, London, at a temperature of 62° F. This is the standard yard. This standard is not big enough for all purposes, and so themile (= 1760 yds.) is used for the the measurement of greater lengths. Similarly, for some purposes it is not small enough, and hence the yard is further subdivided to feet and inches. The British system, or F.P.S. system, has for units of length, mass, and time, the foot, pound, and second. The foot is defined above. The unit of time, the mean solar second, is derived from the average length of the solar day. The unit of mass, the pound avoirdupois, is the mass of a piece of platinum preserved in the Exchequer offices. English commercial measures are arranged at 62° F. in air, the barometer being 30 in, at mean sea-level.

BRITISH SYSTEMS

MONEY

4 farthings (f). = 1 penny (d.) = 1 shilling (s.) 12 pence = $\hat{1}$ pound (£) 20 shillings . or 1 sovereign

Standard gold coin is 22 carats, i.c. is standard gold com is 22 carass, i.e. is an alloy of 22 parts gold to 2 parts of copper. Silver coins are also of alloy, being made of 222 parts silver to 18 of copper. 'Copper' money is made of bronze (95 copper, 4 tin, and 1 of inches the later are larger to the copper. zinc), the halfpenny being 1 in. in diameter, and three pennies and five halfpennies weighing the same, viz. 1 oz. avoirdupois.

LENGTH (LONG MEASURE)

12 inches (in.) . ---1 foot (ft.). 3 feet . = 1 yard (yd.). 51 yards = 1 rod, pole, or perch. 40 poles(220 yds.) = 1 furlong (furl.).

8 furlongs (1760 yds.) =

1 mile (m.). 3 miles = 1 league.

Additional measures of length are: 1 chain . 10 chains = 100 links = 22 yds. = 1 furlong

(Used in land surveying)

6 feet . = 1 fathom. 100 fathoms = 1 cable's length (For recording depth of soundings)

= 1 knot 6080 ft. = 1 nautical mile 1870 yards (For measuring rate of sailing)

4 inches = 1 hand (Used in measuring horses)

weight.

AREA (SQUARE MEASURE)

144 square inches = 1 square foot. 9 square feet = 1 square yard.

301 square yards = 1 square pole. 40 square poles = 1 rood. 4 roods . .

yds.). 640 acres . . = 1 square mile.

= 1 acre (4S40 sq.

Since 22 yds. = 1 chain, then 484 sq. yds. = 1 sq. chain. Thus a square chain is 10 part of an acre, or 6400 square chains are contained in a square mile.

MEASURES OF VOLUME AND CAPACITY

Cubic Measure

1728 cubic inches = 1 cubic foot. = 1 cubic yard. 27 cubic feet

Cubic measure is used for measuring the volume of solids, such as stone, brickwork, and wood.

40 cubic feet. A marine ton = 108 cubic feet. 1 stack = 1 cord 128 cubic feet.

For solids such as corn, sand, etc., measures of capacity may be used.

Measure of Capacity (Liquid or ' Dry ' Measure)

4 gills == 1 pint. 2 pints 1 quart. 4 quarts 1 gallon. == 2 gallons 1 peck. = 4 pecks = 1 bushel. 1 quarter. 8 bushels ---1 load. 5 quarters =

=

1 last.

One gallon of water weighs 10 lbs. avoirdupois and contains 277.463 avoirdupois and contains In U.S.A. the gallon contains only 231 cub. in., and the other measures are proportionately smaller. The pint of 'liquid measure' is also only about ? of the pint of 'dry

2 loads

measure.

Wine Measure

		"	1116	THE	is iii c
2	pints			==	1 quart.
4	quarts			===	1 gallon.
10	gallons			==	1 änker.
$\overline{42}$	gallons			==	1 tierce.
	tierces			===	1 puncheon.
1 į	punche	ons		==	1 pipe or butt
$\bar{2}$	pipes			==	1 tun.

tle and Reer Measure

	211	e ui	ш	Deel	111	cusure
4 1	rills			m		pint.
2 1	pints		٠	==		quart.
	quarts			222		gallon.
	fallons			272		firkin.
	irkins			222	1	kilderkin.
	kilderki	ns		===	1	barrel.
	parrels			==		hogshead.
	iogshea	ds.		===	1	puncheon.
îåî	punche	ons		===		butt or pipe.

the casks, but always 2 horsheads
= 1 pipe or butt, and 2 pipes
or butts = 1 tun. A hogshead of
claret = 46 gals.; 1 pipe of Madeira
or Cape Pontae = 92 gals.; 1 pipe of
Marsala = 93 gals.; 1 pipe of port =
115 gals.; 1 pipe of Lishon = 117 gals.;
1 butt, of charry = 108 rolls.; 1 or 1 butt of sherry = 108 galls.; 1 aum of Hock or Moselle = 30 gals.

WEIGHTS

1. Avoirdupois Weight

16 drams 1 ounce. 16 ounces ---1 pound. 14 pounds **F**112 1 stone. 2 stones (28 lbs.)= 1 quarter.

4 quarters . 1 hundredweight == (cwt.).

20 cwt. . 1 ton. By the Weights and Measures Act, 1878, it was enacted that gold, silver, platinum, and precious stones might be sold by troy weight, and also that drugs might be sold by apothecaries'

2. Troy Weight

24 grains . . 1 pennyweight (dwt.). 20 pennyounce (oz.

weights troy). 12 ounces troy 1 pound (troy)

1 lb. troy = 5700 grains, and 1 lb. avoirdunois = 7000 grains (troy).

3. Apothecaries' Weight

20 grains or minims CCZ 1 scruple. 3 scruples ---1 drachm. 8 drachms LT 1 ounce. 12 ounces 1 pound.

480 grains. harmaconcia weight by ounce of 480

grains, employing in its place the ounce (avoirdupols) of 1371 grains. Thus anothecaries' weight became:

> 1371 grains I ounce. 1 pound. 16 ounces 71

4. Apothecaries' Fluid Measure 63 60 minims 1 fluid drachm.

1 fluid ounce. 8 drachms 2.3 1 pint (pt, or 0). 20 ounces **E**:2 8 pints . 1 gallon (gal., C., or Cong.).

For rough approximation, one halfwineglassful = 2 tablespoonfuls

4 dessert-spoonfuls = 8 teaspoonfuls = 8 fluid drachms = 1 fluid ounce.

5. Diamond and Pearl Weight

I carat. 31 grains (av.) or 4 pearl grains . 1511 carats . . 224 1 carat. 1 ounce (troy)

Imported wines have varying sizes for The pearl grain is smaller than the

grain avoirdupois, 5 pearl grains necessarily be of invariable length, being equal to 4 avoirdupois grains, and there must be one more day in a and 600 to the troy ounce. By the sidereal year than in a solar year. Weights and Measures Act of 1897
Weights and Measures Act of 1897
The length of the sidereal day = 23 hrs. 56 min. 4 sec. of a common United Kingdom for all purposes—then 1 avoirdupois grain = 65 milligrammes, 1 pearl grain = 52 milligrammes, and 1 carat = 205 milligrammes.

ANGLE MEASURE.—The magnitude of an angle is generally expressed in circular measure for scientific purposes. The unit of circular measure, the radian = the angle subtended at

MEASURES OF TIME

```
60 seconds .
                    ==
                         1 minute.
60 minutes.
                    =
                         1 hour.
24 hours
                    =
                         1 day.
 7 days
                    ==
                         1 week.
365 days . 366 days .
                    ==
                         1 year.
                         1 leap year.
                     ==
100 years
                    227
                         1 century.
```

The solar day is the interval between 60 minutes . two successive passages of the sun 90 degrees over the meridian of a certain place. This interval varies in length since (1) the earth's orbit is an ellipse and not a circle; (2) the sun is not in the centre of the ellipse, but in one of the foci; and (3) the sun's path does not travel due E. and W. During the solar day the earth revolves on its axis nearly one degree $\left(\frac{360}{365\cdot25}\right)$ more the British or F.P.S. system. In the

between two passages of a star over units from which various absolute the same meridian. This interval units are derived (see UNITS.) requires the earth to revolve exactly (For the metric system see article 360° on its axis; and the period must on METRIC SYSTEM.)

the radian = the angle subtended at the centre of a circle by an arc equal to the radius. To convert degrees to radians the following formula is emθ θ^{2} ployed $\frac{60^{\circ}}{360^{\circ}}$ = where $\theta = the$ 2π angle in radians, θ^2 = the angle in degrees, and $\pi = 3.1416$. 60 seconds (*) = 1 minute (').
1 degree (°). == I right angle.

= PAPER MEASURE

24 sheets = 1 quire. 20 quires = 1 ream. 2 reams _ bundle.

than 360°, owing to the amount of its latter the units of length, mass, and movement in its revolution round the time used are the centimetre, gramme, sun. The sidereal day is the interval and second. These are fundamental

MISCELLANDOUS WEIGHTS AND MEASURES

```
Anchovies, barrel .
                                =30 \text{ lbs.}
Barley, bushel . . . Beer, butt . . .
                               =47 to 49 lbs.
Beer, butt = 100 gals.
Biscuits (Admiralty bag) = 102 lbs.
Brandy, puncheon .
                            · =120 gals.
          hogshead .
                             =60 gals.
Butter, barrel . . . Cocoa, bag . . .
                               =224 lbs. (4 firkins)
                               = 112 lbs.
= 140 to 168 lbs.
= 224 to 280 lbs.
               . . .
Coffee, bag
         bale (Mocha)
                                =112 to 168 lbs.
         barrel
Cotton, bag (American)
                                =400 to 500 lbs.
=700 to 740 lbs.
                (Egyptian)
   ••
          ,,
                (Indian)
                               =500 to 600 lbs.
Flour, American barrel.
                               =196 \text{ lbs.}
        barrel
                               =220 \text{ lbs.}
   ,,
        bushel
                               =56 lbs.
   ,,
        sack .
                               =280 \text{ lbs}.
Grain, last
                               =80 bushels.
Gunpowder, barrel .
Hay, truss (old)
                               =100 lbs.
                             = 56 lbs.
= 60 lbs.
              (new)
       load (old) .
                             . =18 cwt. (36 trusses)
                             = 19 cwt. 1 qr. 4 lbs.
Hides, last
Hops, bag
             (new)
                            = 12 doz.
                            =280 \text{ lbs.}
        pocket
                            . = 11 to 2 cwt.
. = 14 stone
Oats, barrel .
       bushel
                               =38 to 40 lbs.
  ..
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MISCELLANEOUS WEIGHTS AND MEASURES-continued
   Pepper (black), bag
                               =316 \text{ lbs.}
            (white), bag
                              =168 lbs. =224 lbs.
   Pork, barrel
   Potatoes, sack
                              =168 lbs.
                             =100 lbs.
=112 lbs.
=168 lbs.
  Quintal
   Raisins, barrel
   Rice, bag
   Rye, bushel.
                              =55 lbs.
   Sago, bag
                              =112 lbs.
  Silk, hank
                              =840 yds.
  Saltpetre, bag
                              =168 lbs.
  Soft soap, barrel or pack = 256 lbs.
              firkin
                              =64 lbs.
  Straw, truss .
                             =36 \text{ lbs.}
          load .
                              =36 trusses
  Sugar, bag
                              =112 to 196 lbs.
  Tobacco, hogshead .
                             =12 to 18 cwt.
  Turpentine, barrel
                             =224 to 280 lbs.
  Wheat, bushel
                             =57 to 60 lbs
  Wool, sack
                             =364 lbs.
```

WEIGHTS, MEASURES, AND MONEY OF FOREIGN COUNTRIES.

It is impossible in the short space allotted to this article to give the various weights and measures of all the different countries. In Canada, Malta, and U.S.A. the British weights or 11 lath = 1 guz. The Bencal and measures are used. With slight maund (82) lbs. bazaar weight; facmodification of the names used, the tory weight is if of bazaar weight.) metric system has been adopted by = 40 sers (1 ser = 16 chittacks.) In Austria, Belgium, Brazil, Bulgaria, Madras S vis = 1 maund, 20 maunds Central American states, Chile, Egypt, = 1 candy = 500 lbs. Thus the Central American states, Chile, Egypt, France, Germany, Greece, Italy, Madras maund is less than the Bengal Mexico, Norway, Peru, Roumania, Servia, Spain, Sweden, Switzerland, Turkey, etc., etc. Burma and Brittish India use the same weights and Some of the more common measures. measures. The various measures in use abroad are given with their vary considerably, and much confu-English equivalents below:

sion is the result. For Bengal we have lineal measure:

inch } 1 jow or job 3 jobs ungli or ungulee. 3 ungli

1 girah. 8 girahs === 1 lath or cubit. 2 laths == 1 guz 100

In Bombay 1 guz = 29 in., and 24 tasu or 1½ lath = 1 guz. The Bengal Madras maund is less than the Bengal maund by one-third. The Bombay ser

China-1 catty = 1} lbs., 1 picul = 1 cwt. 21½ lbs. (100 cattles).

Greece—Oke =21 lbs., quintal = 123 lbs.
Russia—Pood =36 lbs., chetwert =51 bushels, verst =7 miles.

Denmark-Tönde of land = about 11 acres. Tönde of coal =4.6775 bushels. Tönde of corn = 3.8 bushels.

== 1.102 lbs. Pund Sweden—Skälpund = 1 lb. (*937 lbs.).

Kanna = 4*608 pints (½ gallon).

Turkey—Oke = about 2½lbs.

Turkey-Oke Quintal =125 lbs.

TABLE OF FOREIGN MONEYS

Country Austria-Hungary			Money of account	Value in British Money			Coins	
			Krone or		s. 0	d. 10	20 krone (G.) \$\circ 16s. 8d., 10 hellers (n.) \$\cdot 1 krone	
Belgium Brazil	:	:	:			2		10 miireis (G.) ~ £1 2s. 54d. 40 reis (b.) ~ 1d., 100 reis ~1 miireis (s.)

British Empire-Same as Great Britain Australasia British Honduras Dollar of and Canada . U.S.A.

TABLE OF FOREIGN MONIES—continued

Country				Money of account B		alue sh M	in loney	Coins
British Emp	piro	•		Silver rupee	£	s. 1	d. 4	15 rupees (G.) =£1
Ceylon . India .		•	•	Rupee (=16 annas)	ŏ	i	4	15 rupees (G.) =£1 1 rupee (s.) =1s. $0 \nmid d$. 1 anna = 1d. 1 pice (b). = $\nmid d$. 1 pie = $\mid a \mid d$.
Hong Ko Labuan Straits ments	ng 1, Se	and ttle	d ;-	British and Mexican silver dol- lar				Same as Japanese yen
Newfound S. Africa Bulgaria		nd	•	Gold dollar of Same as Grea See France				
China		•	•	Silver tael	0(8	6 abo	6 ut)	1000 cash = 100 conderin =10 mace =1 silver
Denmark, N			у,	Krone	0	1	11	tael = $6s$. $6\frac{1}{4}d$. 20 krone (G.) = £1 2s. $0\frac{1}{2}d$. 100 öre = 1 krone (s.)
Egypt		•	•	Gold pound of 100 piastres	1 0	0	3}	Pound (G.), 10 piastres (s.) 1 mil $(n) = \frac{1}{2}d$.
Finland . France .		•	:	Mark Silver franc = 100 cen- times	0	0	91	10 and 20 marks (G.) 25 francs (G.) = 19s. 10d. 20 francs (G.) 10 francs (G.) 5 francs (G.)
Germany .				Mark	ŋ	ø	112	1 franc (s.), 10 centimes (b.) 100 pfennige, 1 mark (s.), 20 marks (G.) = $10\frac{1}{2}d$.
Greece .		•	•	Drachma	ŋ	0	9}	5, 10, 20, 50, and 100 drachmas (G.), 5 drach- mas (s.)
Holland and E. Indies	d I	out	ch	Florin	0	1	7}	100 cents. =1 florin (s.), 10 florins (G.)
Indo-China		•	•	Piastre	0	ţ	2	1 piastre (s.), 5 piastres (G.)
Italy	•	•	•	Lira	0	0 2	9 <u>1</u>	5, 10, 20, 50, and 100 lire (G.), 5 lire (s.)
Japan Mexico		•	•	Yen Peso	0	4	01	100 sen = 1 yen, 1, 2, 5, 10, and 20 yen (G.)
Persia .	•			(100 cents.) Khran of	0	0	111	1 peso (s.), 5 peso (G.) = £1 0s. 2½d. 1 toman (G.) = 200 shahis
Portugal				20 shahis Gold milreis	0	4	5 }	=9s. 5d. 1 coroa (G.) of 5 milreis =
Russia				(1000 reis) Silver rouble of 100	0	2	1 }	£1 2s. 2¼d. 100 reis =1 teston (s.) 1 kopeck (b.), 1 rouble (s.), 10 roubles (G.)
Spain .				kopeeks Peseta	0	0	8 3	25 pesetas (G.), 5 pesetas (s.)
Sweden Switzerland S. America	d	Što	•	Same as Nor Same as Fra			nd D	
Argentin		•	•	Silver peso of 100 cents	U	3	111	5 pesos (G.) = $19s. 10d.$
Chili, Co and U	lui	nbi gua	a, y	Silver peso of 100 cents.	0	3	9	5 pesos (G.) = $18s. 9d.$
Peru Turkey (C Empire)	itte		٠.	Silver sol Gold Turk- ish pound of	0	15	0 \$ 0	1 libra (G.) = £1 1 piastre (s.) = $2d$.
United St	٠			100 piastres Gold dollar of 100 cents.	0	4	1 }	1 cagle or 5 dollars (G.)
	(G.,	gol	d; s., silver;	n.	, ni	ckel ;	b., bronze.

LAWS OF WEIGHTS AND MEASURES. 101 m. E.N.E. of Mannheim; his The Act of 1878 was the principal tanneries and various manufs. It Act, amendments being made by the Acts of 1889, 1892, and 1897. Section 1 of the Act of 1897 declares legal the use of metric weights and measures for all purposes. Bread Act of 1836 makes bread saleable only by weight, except in the case of French and fancy bread or rolls. In Scotland (Act of 1892) and in Newfoundland the weight of bread must be stamped on the loaves. The Acts of Parliament referring to weight. measures, and coinage, may be seen at the British Museum, and, as a rule, in public libraries, assize courts. etc., and a 'Chronological Table and Index to the Statutes' may be obtained from his Majesty's stationers.

See Buchanan, Tables of Weights and Measures, 1835; J. H. Norman, The Universal Cambist, 1897; Browne, Money, Weights and Measures of all Nations, 1899; Martin, Tables of Weights, Measure and Coinage, 1904.

Weihaiwei, a British territory and coaling station in the Chinese prov. of Shantung, with a total area of 285 sq. m., including the Is. of Liuking. In 1895 it was taken from China by the Japanese, who left it three years It was then leased by the Chinese government for ninety-nine years to Great Britain. Farming and fishing are the chief industries of the

inhabitants. Pop. about 150,000.
Wei-ho, a riv., China, flows E.
through the S. of the prov. of Shensi
to join the Hwang-ho above Tung-

kwan.

Weil, Gustav (1808-89), a German Orientalist of Jewish descent, born He became librarian at Sulzburg. (1838) and professor of Oriental languages (1861-89) at Heidelberg. his Among hammed der : der Chalifen,

den der Mi trans. 1846).

Weimar, a city of Germany, cap. of the grand duchy of Saxe-Weimar, on the l. b. of the Ilm, 13 m. E. of Erfurt. It is justly famous as having been at one time the residence of the most illustrious men of letters in Germany (e.g. Goethe, Schiller, Herder, and Wieland) under the patronage of the Duke Charles Augustus. It has also various manufs. Pop. 34,582.

Weimar, see SAXE-WEIMAR. Weinberge, or Königliche Weinberge, a tn., Bohemia, Austria, on the Moldau; an eastern suburb of Prague.

Weingarten, a tn., Würtemberg, and Berlin.

Germany, 43 m. S.S.W. of Ulm. The Tübingen in Abbey Church (1724) contains a magnificent organ. Pop. 8077.

Weinheim, a tn., Baden, Germany,

was destroyed by the French in 1655, Pop. 14,159.

Weinsberg, a tn., Würtemberg, Germany, 26 m. N.E. of Stuttgat. The Castle of Weibertreu (woman's faithfulness) was the scene of a famous siege in 1140. Pop. 3271.

Weipert, a tn., Bohemia, Austria on the Erzgebirge, at an alt, of 2380 ft., 37 m. W. by S. of Tenlitz manufs. laces and haberdashery.

Pop. 11,834.

Weir, see Reservoir.

Weir-Mitchell Treatment, or Rest Cure, a system for curing certain functional nervous conditions. In its thorough form it involves absolute rest in bed, no effort of any kind being allowed. Nourishing food, especially milk, must be taken in great abundance, and massage and electrical treatment are applied.

Weishaupt, Adam (1748-1830), a German jurist and author, born at Ingolstadt, in Bavaria, where he became professor of canon and natural law (1772-85). He founded the Order of the Illuminati (1776), and wrote Apologie der Illuminaten (1786).

Pythagoras (1790), etc. Weissenburg, a tn. of Germany. in Alsace-Lorraine on the R. Lauter, 20 m. W. of Karlsruhe. Under the old German empire it was a free city until the end of the 17th century when it was ceded to France. In 1870 the first battle of the Franco-German War was fought here, when the Crown Prince of Prussia defeated the French troops under Douay. now an industrial town with manufs. of leather, matches, and stockings. Pop. 6772

Weissenfels, chief th. of a circle of the gov. of Merseburg in the Prussian prov. of Saxony. Pop. (1911) 19,738. Weissensee, a tn., Saxony, Prussia. 16 m. N. by E. of Erfurt. Pop. 13,031.

Weisshorn, a mountain of the Swiss Alps, canton Valais, between Nick-lausthal and Val d'Anniviers, W. of the Zermatt Valley, rises to 14,800 ft. Th

Pr ' Her gary. ten s silk and wine industries. Pop. 11,000. A tn., Moravia, Austria, on the Berzwa, 22 m. S.E. of Olmütz; manufs. cloth. Pop. 8732. Weizsacker, Karl (1822-99), a Ger-

man Protesta

Ochringen, ar

translated.

Weizsacker, Julius (1828-89), German historian, brother of the forezoing, born at Ochringen; educated Tübingen and elsewhere. lessor of history at Tübingen (1867) and Berlin (1881). His works deal chiefly with German mediæval history, and are characterised by vast crudition, but are faulty in point of style and interest.

Welbeck Abbey, seat of the Duke of Portland, and incorporating the remains of a 12th century abley, stands in a park of 2283 acres, in Welbeck parish, Nottinghamshire, England, 31 m. S.W. of Worksop.

Welcker, Friedrich Gottlieb (1784-

1868), a German philologist, born in Grünberg, and studied at Giessen. In 1806 he travelled to Rome, where he met the famous Danish archgologist, Zoega, whose life and essays he afterwards published, and by whose example he was stimulated to that subtle appreciation of the works of ancient art which appears every-where in his works. On his return he held important professorships at German universities. Some of his writings are: Die Aschyleische Trilogie: Der epische Tyllos der die Homerischen Gedichte: Griechische Gölterlehre. See Life by Kekule (Leipzig, 1880).

Weld, Woold, Dyer's Rocket, or Greenweed Reseda lufcola), a tall plant (order Reseduceæ) with racemes of yellow flowers. It occurs on chalky soils and was formerly grown to

furnish a yellow dye.
Welding. Through a wide range of temperature below its melting-point iron has the property of continuing in a pasty condition. Therefore, when raised to a white heat, pieces of iron or steel can be welded or united, by pressure or hammering. Most metals pass rapidly from the solid to the liquid state, and so do not fulfil the paging from the temperature of annealing. A tn. in Somerset, England. 7—Thus the crystals are able to recover from Taunteen taute after any deforms. working the metal.

Well, see Artesian Wells, Bor-ing, Water Supply.

NG, WATER SUPPLY.
Welland: 1. a tn., Welland co.,
Ontario, Canada, 24 m. W.N.W. of
Buffalo. Pop. 6500. The Welland
Canal (1824-20) between Lake Ontario (Port Dalhousie) and Lake Eric

Only a few of his works have been A river, England, rises on the boundary between Northamptonshire and Leicestershire, and flows N.E. to the Wash, which it enters 9 m. below Spalding, to which town it is navigable. Length 70 m.

Welle, a river of Central Africa, trib. of the Congo. It rises in about 31° N. 28° E., and flows W., turns abruptly S. and forms the difficult Tongo rapids, and finally enters the Congo in about 30' S., 17° 50' E. It was first discovered in 1870, since when various further explorations have been made.

Wellesley, a tn. of Norfolk co., Massachusetts, U.S.A. Its College for Women (founded 1870) had in 1913 1375 students with 123 instructors. Wellesley, Arthur, see Willing-

TON.

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Wellesley, Richard Colley, first Marquess Wellesley (1760-1842), a statesman, was the eldest son of Gamett W., first Earl of Mornington, and the brother of the first Duke of Wellington and Lord Cowley. He went to India in 1797 as governor-general, which position he held for eight years, when his policy was much attacked, but finally approved. In 1809 he was sent as ambassador to Spain, and on his return in that year became Foreign Secretary in Per-He was Lord. ceval's ministry. Lieutenant of Ireland from 1821-28. and again in 1833-34. He retired from public life in 1835. His Indian despatches were published in 1836. There are biographies by Pearce There are biographies by (1846), Malleson (1889), (1880), and Hutton (1893). (1889). Torrens

Wellesley Province, sec PROVINCE WELLESLEY.

Wellingborough, a market tn. of Northamptonshire, on the Nen, has manufs. of boots and lace, and some

manuis, of boots and face, and some trade in corn. Pop. (1911) 19,758.

Wellington: 1. A tn. in Shropshire, England. 10 m. E. of Shrewsbury, at the foot of the Wrekin, in an Duke of Wellington took his name from this place, and on the summit of the Black Downs is a monument to his memory. Pop. (1911) 7634. 3. The cap. of New Zealand, a city in the prov. of the same name in North Is., situated on Cook Strait. It is the seat of Victoria College and a branch of the New Zealand Institute. Among its public buildings are: Government House, Houses of Parliament, a museum, and Freemasons' Hall. It (Port Colbourne) runs parallel with its public buildings are: Government the Niagara R. By the enlarged route (completed 1888) it is 261 m. House, Houses of Parliament, a museum, and Freemasons' Hall. It long, 14 ft. in depth, and by means of twenty-six locks rises 326; ft. 2. manufs. of candles, soap, wool, matches, boots, etc. The exports and imports in 1911 were valued at his command and appointment in £9,320,509. Pop. (1911) 64,372; with suburbs 70,729. 4. A tn. of New S. Wales, Australia, in Wellington co., on the Macquarie R., 65 m. N.N.W. of Bathurst. The district is agricultural earlie and cheen her prepred and controlled to the street of the str tural, cattle and sheep are reared, and fruit, wheat There are

the neighb

the neighb
Atn. of Cape Colony, S. Africa, about 50 m. N.N.E. of Cape Town, not far from Bain's Kloof pass. Pop. about 5000. 6. The cap. of Sumner co., Kansas, U.S.A., on Slate Creek, 30 m. S.W. of Wichita, with grain clevators, flour mills, etc. Pop. (1910) 7034.
Wellington, Arthur Wellesley, first Duke of (1769-1852), third son of Garrett, first Earl of Mornington, born either at Dangan Castle, co. Meath, Ireland, or at 24 Upper Merrion Street, Dublin (see on this Burke's Pecrage and the National Dictionary of Biography); educated at Dictionary of Biography); educated at Eton, whence he was removed owing to the early death of his father, and later at Pignerol's Military Academy at Angers. Entered as an ensign in the 73rd regiment in 1787, and then for a few years sat as member for Trim. But after he commenced his military command at the head of a brigade, under the Duke of York, in Holland, in 1794, down to the climax of a phenomenal military career at Waterloo, he did not, at least for any appreciable period, pursue politics. It was in India as a colonel in the war against Tippoo that he first gave signs of that transcendent military genius, which in less than twenty years was to earn for him the highest honours it is in the power of any state to confer upon a military hero. After being left in command of the troops at Mysore, he baffled Napoleon's Oriental plan of a descent on Southern India from Egypt as a base, by invading Mysore and destroying or scattering the 40,000 followers of Dhoondyah Waugh before a French soldier could have been sent there. In 1803 he was appointed chief political and military agent in the Deccan and the Southern Mahratta states, and on the fresh outbreak of trouble with the native Seindiah and Stolkar, he chiefs, Seindiah and Stolkar, he added to his reputation by the signal defeat of an overwhelming force at Though he received the thanks of parliament and wasknighted for his services he does not appear either to have been satisfied with his treatment or his prospects. He advised his brother, the governor-general, to resign on the ground of the hostility of the directors of the E. India Co. and the want of support from the cabinet (National Dictionary leon by his last and greatest victory,

councillor; but on the threat of a French invasion he was soon in active service again. After a short campaign in Denmark, which ended in the complete humiliation of the Danes, he was sent to Spain, when it became clear that it was possible materially to check French pretensions in that country. He landed at Corunna in July 1808, but not being in sole or chief command was almoimmediately involved in difficulties with incompetent rivals like Darymple and Burrerd, much in the same way that his genius was thwarted in India by persons whose social status was in advance of their martial capacity. In 1809, after his roturn to England and resignation, he was sent out in sole command, and from that point onward began a series of splendid victories which culminated in the complete evacuation of Portugal and Spain by the French. He drove Soult from Oporto and routed him near the mountains of Galicia. He then marched into Spain and defeated the French at Talayera (being created Baron Doure of Wellesley and Viscount Wellesley of Talavera). After rendering Lisbon secure by the wonderful achievement of the lines of Torres Vedras, he defeated Massena, the most famous of Napoleon's generals, at Almeida, and so cleared Portugal of the French. He took the fortresses of Badajoz and Ciudad Rodrigo after a flerce fight with Masséna at Fuentes d'Onore, and soon afterwards entered Madrid in triumph after winning the battle of Salamunca. Other great French armles, however, poured into Spain, and W. wintered in 1812, within the lines of Torres Vedras. It was at Vittoria that he gained the most de-cisive victory of the Peninsular War-routing King Joseph and Marshal Jourdan and capturing a vast amount of arms and ammunition. unable to drive back the English and the allies, was forced back, after a series of defeats in the Pyrenecs, into France, and W., following him up, clinched his brilliant campaign at Toulouse. In 1815, loaded with honours, W. was ambassador to the restored Bourbon court, and British response of the court, and the concession of the concession of the concession. representative at the congress of European powers at Vienna, when news came of Napoleon's escape from Elba. In a few months W. had rid Europe of any further fear of Napoof Strathfieldsaye in Hants, and received with every conceivable honour. Re-entering the political field he was twice Secretary of State, and once Prime Minister. He was by no means a great politician, but was at least honest and sagacious in his opposition to electoral reform and his militarist oppression of the Chartists. Died at Walmer Castle, and buried in the War in 1815.

Wellington College, a military school (and railway station) Ports shire, England, 4 m.

Wellingtonia, see SEQUOIA.

Joseph and his Brethren, 1824 (new ed. 1876); and Claribel, 1845. In 1874 he burnt a number of plays and poems in disappointment at his want of, success. He has been highly praised by Swinburne. Wells, Henry Tanworth (1828-1993),

an English painter, born in London. He was at first a miniature painter. In 1845 he exhibited 'Mester Arthur Prinsen,' at the Royal Academy. He was elected A.R.A. in 1866, and acted as deputy president of the Academy during Lord Leighton's absence. His works include: 'Tableau Vivant,' 1865; 'Victoria Regina,' 1880; and The Queen and her Judges, 1887.

Wells, Herbert George (b. 1866), an English novelist, whose works are see WALES.

Waterloo (q.v.), and returning to translated into several languages. He England was granted £200,000 for the began by establishing a new type of purchase of the estate and mansjon story evolved from a combination of scientific facts and imagination, of which his Time Machine (1895) and The War of the Worlds (1898) are examples. He is much interested in examples. He is much interested in Socialism, and was a member of the Fabian Society. New Worlds for Old (1908) and A Modern Ulopia are a record of his thought and opinions about this time. His novels have since then always had a sociological Died at Walmer Castle, and buried in Westminster Abbey by the side of Havour, but their later tendency is Nelson. See W. H. Maxwell's Life. to avoid dialectic of any kind, and Military and Civil of the Duke of Wellington, 1849; C. D. Yonge's Life merely to present conditions and environments without any political bias. Some critics have seen, however, in the later sociological novels, such as Wellington, 1888 (consisting of extracts from despatches and other works); Lord Roberts' Rise of Wellington, 1895; Napier's History of the War in 1815. of Mr. Polly, 1910; Marriage, 1912; The Passionate Friends, 1913.

Wells, Sacred, have been centres of worship and religious magic from the times. The primitive mind shire, England, 4 m. times. The primitive mind tes all the forces of nature (1856), in memory of the Duke of with the act of some being capable of wellington, for the education of the sons of deceased military officers. Wellingtonia, see SEQUOIA. separate from, and often inhabiting Wells: 1. A city, bishop's see, the place or thing connected with parl, and municipal bor, in the co. of him. Thus it is not strange to find Somerset, 120 m. from London. Its the conception of water-spirits and history begins in Saxon times, and nymphs in all parts. Great Britain Ina, King of Wessex, is said to have shared this state of mind, and the shared this state of mind, and the conception continued in contain separate from, and often inhabiting Ina, King of Wessex. is said to have founded its first church in 704. Its old conception continued in certain cathedral is mainly Early English. It popular ceremonies down to quite has manufs. of paper, brushes, etc. Pop. (1911) 4655. 2. A seaport of worfolk, 24 m. from King's Lynn. It substituted for the original waterhas a trade in malt, corn, and fish. Pon. (1911) 2565.

Wells, Charles Jeremiah (c. 1799-lichfield), St. Arrive (1914) with St. (1914) with S the death of an enemy.

Wellston: 1. A city of Jackson co., Ohio, U.S.A., is the centre of a great coal and iron mining district. Pop. (1910) 6875. 2. A suburb of St. Louis, Missouri, U.S.A. Pop. (1919) 7312.

Wellsville: 1. A city of Columbiana co., Ohio, U.S.A., on the R. Ohio, 52 m. below Pittsburg. It is an active 52 m. below Pittsburg. It is an active commercial centre, with various manufs. Pop. (1910) 7768. 2. A tn. of Alleghany co., New York, U.S.A. Pop. (1910) 4382.

Wels, a tn. of Upper Austria, on the l. b. of the Taun. It has manufs. of powder, parer, leather, etc.

Welsh John are Weight John.

Welsh, John, see Willen, John. Welsh Language and Literature,

Welsh Onion (Allium pstulosum), deavoured to make his people also a perennial plant with long fibrous Christians, and was assassinated by

in the spring.

Welsh Rabbit, the name given to a savoury consisting of cheese which is melted and seasoned and spread over the Emperor Charles IV. We so not buttered toast. The phrase is probably of slang origin, like Munster rebelled against him and made him plums which means potatoes.

form rarebit is doubtful. Welsh Terrier, a small attractive terrier of about 20 lbs. in weight. Its colour is black and tan, or black, grizzle, and tan. and except for this it strongly resembles the wire-haired fox terrier, though its skull is slightly wider between the ears; these are V-shaped and are carried forward on the cheeks; the neck is moderately long, and the shoulders strong and sloping; the ribs are deep and well sprung, and the chest is deep though narrow; the thighs are muscular and the forelegs straight and well boned: the feet are small and round, and the coat is hard, wiry, dense and close.

Welwitsch, Friedrich Martin Josef (1806-72), an Austrian botanist, born at Klagenfurt, Carinthia. In 1839 he went on a botanical expedition to the Cape Verde Is. and the Azores, and became director of the botanical gardens at Lisbon. From 1853-61 he was engaged in botanical expeditions in Portuguese West Africa. In 1863 he settled in London. He published: Synopse explicativa das amostras de madeiras e drogus medicinas de collegidas na provincia de Angola, 1862.

Wembly, an urban dist. of Middle-sex, near Harrow-on-the-Hill, on the

Brent. Pop. 4500.

Wemyss, a par., Fifeshire, Scotland, on the Firth of Forth, 21 m. S.W. of Leven, includes the vils. of Methil and Innerleven, West and East Wemyss, all engaged in coal-mining. Pop. (1911) 23,104. Wemyss, East and West, two ad-

joining vils.. Fifeshire, Scotland, 1 m., S.W. of Buckhaven. West W. has S.W. of Buckhaven.

These are of the du and the gland by

They may be removed by making a maic.

Wentworth, Thomas, see Straf-of Bohemia about 928-936. Being converted to Christianity, he en-

a perennial plant with long indicates the plant of the plant for its large succushis brother in consequence. He was lent leaves, which are used in salads regarded as the patron saint of Bohemia.

Wenceslas IV., King of Bohemia and Holy Roman Emperor, the son of The a prisoner, till he was set free through the influence of the princes of the German states.

Wen-Chow, a treaty-port of China, in the prov. of Che-Kiang, 163 m. S.S.E. of Hang-Chow. It is well fortified in an out-of-date fashion, and has manufs, of paper, silk, etc.

Pop. nearly 80,000.

Wenden, a tn., Livonia, W. Russia. on the Aa, 60 m. N.E. of Riga by rail, has rains of a castle which was the residence of the Brethren of the Sword and, from 1237, of the grand-master of the Teutonic Knights. Pop. 6400.

Wendover, a tn., Buckinghamshire, England, 5 m. S.E. of Aylesbury.

Pop. 2050.

Wendron, a par. in Cornwall, England, S m. W. by S. of Falmouth. It has tin mines. Pop. (1911) 6381.

Wends, a Slav race found mainly in Lusatia, a dist, between Brandenburg, Saxony, and Silesia. They are the remnant of a nation which formerly extended as far as the Elbe. but is now decreasing almost daily. About the middle of the 16th century W. extended the country of the eastward to the Oder, but has been gradually reduced since then, and it is significant that now even within the limits assigned to the W. German is spoken exclusively in the towns, and practically all speak that language as well as Slav.

Wener Lake, see VENER

Wenlock Beds, a series of rocks belonging to the upper Silurian age. To it belongs Dudley Limestone, a fossiliferous Silurian limestone chiefly developed near the town of Dudley.

a good harbour, and a trade in coal.

Wen East W. is Wemyss Castle, once occupied by Mary Queen of Scots.

Pop. (1911) 6123.

Wen, a term popularly applied to Wen, a term popularly applied to Popula Wen, a term popularly applied to protested that the privilege of any small superficial tumour, and protested that the privilege of more particularly to schaccous cysts, the crown to elect life peers had these are

peers might at the wish wn be outnumbered in the Wensleydale life-peers. lingly created a peer in tail

since then a certain number incision and clearing out the of Lords of Appeal in Ordinary have been created official life-peers.

on the Pleisse, 5 m. N.W. of Zwickau, fessor of mineralogy at Freiburg in with textile and chemical industries, 1775. He was also keeper of the iron foundries, etc. Pop. 20,821.

Werden, a tn. of Rhenish Prussia, on the Ruhr, 16 m. N.E. of Düsselon the Ruhr, 16 m. N.E. of Dusseldorf, with manufs. of cloth, paper, silk, and shoes. It has coal mines and stone quarries. Pop. 12,741.

Werdolff, a vil. of Westphalia, Prussia in the circle of Altena 25 m.

Prussia, in the circle of Altena, 25 m. E. of Barmen, with iron and steel factories. Pop. 9819.

Weregild. In Anglo-Saxon times a money compensation for murder or manslaughter. W. was first intro-duced into Gaul by the conquering Franks, and then into Britain by the Saxon invaders. By this system every man's life had a fixed pecuniary W., and called the thel amount was graduated according to the rank of the person slain; for example, a churl's value was fixed at 200 s.; a lesser thane, 600 s.; a king's thane, 1200 s.; an ealdorman, 2400 s.; an aetheling or prince, 3600 s., and a king 7200 s. The W. of a murdered freeman was payable as compensation to his kin: that of a serf was paid to his master.

Were-Wolf, sec LYCANTHROPY. Werff, Adriaen van der (1659-1722).

a Dutch painter. He lived chiefly at Rotterdam, devoting himself to genre and pertraiture, and in 1696 he was appointed court painter to the Elector Palatine.

Werff, Peter van der (1665-1718), Dutch painter, and brother of Adriaen van der W. He concerned himself mainly with portraiture and

domestic scenes.

Wergeland, Hendrik Arnoldus (1808-45), a Norwegian poet, born at Christians and. After passing through the university, he published a successful dramatic satire. His friends called him the 'Byron of Norway.' W. entered the clerical profession in 1829. but in 1834 resigned. The sentiments expressed in a poem entitled Creation, Man and the Messiah, were deemed incompatible with his sacred calling. He was appointed keeper of the university library, and in 1840 keeper of the Norwegian archives. A colof the Norwegian archives. A colorganists, and devoted considerable lected edition in 9 vols. of his works energy to popularising J. S. Bach. was begun in 1851.

Wernelskirchen at the C. Black of Wesley, John (1703-91), a metho-

16,598.

Werdau, a tn. of Saxony, Germany, Iteristics of Minerals, he became pro-Cabinet of Natural History and coun-

cillor of the mines in Saxony.

Werner, Friedrich Ludwig Zacharias (1768-1823), a German dramatic poet and priest, born at Königsberg in Prussia. While at the university of Königsberg, he came under the influence of Rousscau's teaching and became an ardent romanticist. In 1811 he was converted to the Roman Catholic Church, and three years later was ordained priest and became a popular pulpit orator in Vienna. His Der Vierundzwanzigste Februar (1815) set the fashion of writing 'fate tragedies.' His other works include Die Söhne der Thals, 1803; Martin Luther, 1806; and Wanda, 1810. See Lives by Schülz (1841) and Poppenberg (1893).

Wernigerode, a tn. in the prov. of Saxony, Prussia, at the foot of the Harz Mts., 43 m. S.W. of Magdeburg. It contains the fine chateau of the princes of Stolberg-Wernigerode, with its valuable library. Pop. 18.366. Werther, see GOETHE, JOHANN

WOLFGANG.

Wesel, a tn. and fortress, Westphalia, Prussia, at the confluence of the Rhine and the Lippe, 46 m. S.W. of Münster, has manufactures of wire. lead, and other metal goods, pottery,

cement, and soap. Pop. 24,453.
Weser, one of the largest rivers of Germany, formed by the junction of the Werra and the Fulda, the latter of which rises in the Rhönegebirge From the junction at in Bavaria. Munden the river flows towards the North Sea into which it falls after a course of 225 m.

Wesley, Charles, WESLEY. see

JOHN.

Wesley, Charles (1757-1831), and Samuel (1766-1837), sons of Rev. Charles W. of Bristol, nephews of the famous Rev. John W., both celebrated musical prodigies. Charles was a good organist, and left six organ concertos, a drama, songs, anthems, and other compositions. Samuel wrote an oratorio, Ruth, at eight, became one of England's finest

Wermelskirchen, a tn. of Rhenish dist, was a younger son of Samuel W. Prussia, 20 m. S.E. of Düsseldorf, rector of Epworth and Wroot, and with textile industries and cigar author of many poems. He was factories. Pop. 16,376.

Werne, a com. in Westphalia, Prusand Christ Church, Oxford, and took sla, in the circle of Bochum, with holy orders in 1725. He served his from steel, and chemical works. Pop. father as curate at Wroot from 1727-129, and then returned to the univer-Werner, Abraham Gottlob (1750- sity as tutor in Lincoln College, which 1817), a geologist, was born at position he retained for six years. At Wehrau in Lusatia. Having written Oxford, his younger prother, Charles a treatise On the External Charac- Wesley (1707-88), had formed a small

group of undergraduates who fol- Ine (688-726) the Mercians were dethe church and were dubbed by their laws drawn up. the chirch and were dubbed by their laws drawn up. Eghert (800-36), friends" methodists.' W. joined the who had spent his youth in exile at party and became its leader. Soon the court of Charles the Great, reafter his father's death in 1735, he went to America to take charge of the Georgian mission, but in the following year retired from the charge owing to his being involved in legal (825-29), annexed Kent, Sussex, and Essay and his fore \$82 traces have. proceedings consequent upon his having repelled one of his congregation from the communion. On his return he came under the influence of Peter Böhler, a Moravian, and be-came a momber of that society's chapel at Fetter Lane, London; but in 1740 he broke off his connection chaper at coordinate control of the broke off his connection with it. In the previous year he had begun field-preaching and had opened trait painting at sixteen, and preached all over the country and preached all over the country and settled in London in 1763. Here he will be successful with the with the Established Church than the well-to-do. It was not until 1784 that W. executed the 'deed of de-claration,' from which dates the beginning of modern Methodism. wrote many books and pamphlets, and himself collected his prose works (1771-74) in thirty-two volumes. W.'s Journals are the best authority for his career, but Coke and

(1791-93), ε Wesley, 5

was like his the finest organist of his day; his appointments included Hereford Cathedral (1833-35), Leeds parish church (1842-49), and Gloucester Cathedral He left much magnifi-(1865-76). cent church music, anthems, services, and organ pieces, and the fine work The Wilderness, his best-known composition.

Wesleyan Methodist Churches, sce

METHODISM.

Wessex (O.E. West-seaxe, Saxons), an ancient kingdom in S.W. Britain, founded by the W. Saxons or Gewissas, under Cerdie and his son,

extended his kingdom beyond Hamp-shire and over the Is. of Wight. His son, Ceawlin (560-91), was a warlike king and made ropeated inroads upon In 591 his his British neighbours. Ceaw-

The territory he had conquered beyond the Thames was seized by the Mer-cians, and Wessex ceased to be a powerful state. In the 7th century powerful state. In the 7th century the W. Saxons were converted to Christianity. During the reign of S.W. of Boston. It has a state

lowed very strictly the ordinances of feated at Burford (752) and a code of Egbert (800-36), and Essex, and before \$28 was acknowledged overlord by all the peoples S. of the Tweed. Her territory was increased and her power strengthened under Alfred (q.v.). Consult Elton,

Origins of English History,
West, Benjamin (1738-1820), an
historical painter, born at Springand soon acquired a great reputation for his historical and religious subjects; indeed, so high was he in favour that on the death of Reynolds he was made president of the Royal Academy. Among his pictures are 'Christ healing the Sick' and 'The Death of Wolfe.' He was the first to demy. abandon the Greek and Roman and

introduce modern costume into historical painting. West Africa, British, see Gambia, GOLD COAST, NIGERIA.

LEONE. West Africa, French, see DAHOMET, FRENCH CONG^

IVORY COAST,

West Africa, SOUTH-WEST

TOGOLAND. West Africa, Portuguese, ecc AN-GOLA, PORTUGUESE GUINEA.

West Africa, Spanish, see Frin-NANDO PO, RIO DE ORO, SPANISH GUINEA.

Westall, Richard (1760-1836), an English genre painter, born in Hertford, apprenticed to an engraver on silver in 1779, and entered the schools of the Royal Academy in 1785. He was best known as a book illustrator.
Among his historical painting in water colours the best are: 'Mary Queen of Scots going to Execution, and Jacob and Eau. He became a royal academician in 1791.

West Allis, a banking post vil. of Milwaukee co., Wisconsin, U.S.A., incorporated in 1906. Pop. (1910)

6645.

West Bay City, see BAY CITY. West Baywick, a tn. in Columbia co., Pennsylvania, U.S.A.; incor-porated in 1902. Pop. (1910) 5512. Westborough, a tn. in Worcester co., Massachusetts, U.S.A., 32 m.

lunatic

shoes, leather and straw goods, carpets, etc. Pop. (1910) 5446.
West Bromwieh, a parl., municipal, and co. bor. of Staffordshire, England, 5 m. N.W. of Birmingham. It is a busy industrial town in the heart of the Black Country, with manufs. of hardware, iron goods, bricks, etc. Pop. (1911) 68,345.

Westbrook, a fun, Cumberland co., Maine, U.S.A., 4 m. N.W. of Portland; has paper, silk, and cotton mills. Pop. (1910) 8281.

Westbury, a market tn. of Wiltshire, England, 4 m. S.S.E. of Trowbridge. It has a fine old church with historic associations, and its manufs.

include woollens, clothing, and iron goods. Pop. (1911) 3433.

Westbury, Richard Bethell, Baron (1800-73), Lord Chancellor of England, born at Bradford-on-Avon. He was elected fellow of Wadham College, Oxford (1819), was called to the bar at the Middle Temple (1823), and became leader of the Chancery bar (1841). He entered parliament as Liberal representative for Aylesbury (1851), and in the following year was returned by Wolverhampton, becomreturned by Wolverhampton, becoming Solicitor-General (1852), Attorney-General (1852), and Lord Chancellor (1861). He delivered judgment in the famous Essays and Reviews case of 1863. See Life by T. A. Nash.

West Calder, a tn. and par., Midlothian, Scotland, 15 m. S.W. of Edinburgh; coal incretance and lime.

Edinburgh; coal, ironstone, and lime-

stone are worked. Pop. 3000.
West Chester, a bor. and co. scat of Chester co., Pennsylvania, U.S.A., 25 m. W. of Philadelphia; has large market gardens and dairy farms, and manufs. agricultural implements.

manus. agricultural implements. Pop. (1910) 11,767.
Westcott, Brooke Foss (1825-1901), Bishop of Durham, born at Birmingham. He took holy orders in 1851, was made canon of Peterborough (1869), regius professor of divinity at Cambridge (1870), chaplain to Queen Victoria (1870), canon of Westminster (1883), and Bishop of Durham (1890). He edited the N.T. in Greek with Dr. He edited the N.T. in Greek with Dr. Hort (1882), and wrote: History of the New Teslament Canon, 1855; Introduction to the Study of the Gospels, 1860; Revelation of the Risen Lord, 1881; Social Aspects of Christianity, 1887, etc. See Lives by B. F. Westect (1903) and J. Clayton (1906).

Westerly, a tn. of Washington co., Rhode Is., U.S.A., on the Pawcatuck R.; with woollen and cotton mills.

Pop. (1910) 8696.
Western Australia (Westralia, for-

e asylum, and manufs. of by S. Australia and the Northern leather and straw goods, territory, N.W. and S. by the Indian Ocean. It extends W. of 129° E. tBromwich, a parl, municipal, long, the most westerly point, inlong., the most westerly point, including islands off the coast, being Dirk Hartog Is., off Shark's Bay; and forms about a third of the continent, its area being about 975,920 sq. m. The coast-line is indented, but has few good natural harboure; Fremantle, port of the capital, Perth, on the Swan, is the best. Westralia forms part of 'the great Austral plain,' and is largely plateau land with little vegetation in the interior. A succession of small mounterior. A succession of small mountain chains border the W. and S.W. coast, the Stirling, Darling, Herschel, and Victoria ranges being the chief, and victoria ranges being the chief, while in Kimberley district (N.) are the King Leopold, M'Clintock, and other ranges. There are few large rivers or permanent lakes. Besides the Swan may be mentioned the Blackwood, Murchison, Gascoyne, Ashburton, Fortescue, Fitzroy, and Ord (in order from S.W. to N.E.). The temperature varies considerably, Dec. to Feb. being the hottest months, but in general the climate is healthy. The E. division contains large deserts— the Great Victoria Desert (S.), Gibson (central), and Great Sandy (N.) with dense scrubs of acacia and spinifex (porcupine grass). There are fine forests S.W. and W., abounding in all kinds of eucalyptus gums (jarrah, karri, tuart, wandoo, red garrah, karri, tuart, wandoo, red gum), sandalwood (Santalum cygnorum), baobab, mangroves, and mallet trees (used in tanning), and palms. (For further details of its botany and zoology, see AUSTRALIA.) The best grazing and agricultural land comes S. of Geraldton. The crops include where her the costs and and services are services and services and services are services are services and services are services are services and services are services and services are services are services and services are services and services are services are services are services are services and services are services. wheat, barley, oats, potatoes, and various fruits (peaches, grapes, lemons, oranges). Sheep, cattle, pigs, goats, and other live stock are reared. Camels are used in parts as beasts of burden. Gold, timber, wool, pearl-shells, hides, and pearls (mainly from oyster-beds off Cossack) are the chief exports. The principal gold-fields are Kimberley and Pilbarra (N. and N.W.; discovered 1882), Peak Hill and Murchison (W.); Yilgarn district (188 Black 1891 copper, limestone, and ironstone are also found. The Spanish and Portuguese were the first explorers here, the Dutch followed in the 17th century the and called country Holland.' The 17th to 19th centuries saw numerous explorations of merly Swan River Settlement), a Tasman (1644), Dampier (1688), Van-British crown colony (settled about 1629) and state (1901) of the Common-Forests (1870). The present governor wealth of Australia. It is bounded E. (1913) is Sir G. Strickland, and there

is a Legislative Council of thirty, is divisible into three groups; the elected for six years; and a Legisla- Greater Antilles consisting of Cubannd tive Assembly of fifty, elected for Hispanio'. three years. Both men and women and its -Vivienne (1901), Taunton (1903).

Western Daily Press (Bristol). pioneer provincial newspaper of the W. of England, founded in 1858. Its political views are Liberal Inde-It is one of the chief representatives of the commercial and agricultural life of the western

counties Westfield: 1. A tn. of Hampden co., Massachusetts, U.S.A., 9 m. W. Springfield: with manufs. bicycles, cigars, whips, paper, machinery, etc. Pop. (1910) 16,044. 2. A tn. of Union co., New Jersey, U.S.A., 7 m. W by S. of Elizabeth Pop. (1910) 6420.

West Flanders, a prov. of Belgium, lying N. and E. of France, and bounded on the N.W. by the North Sea. With E. Flanders it was incorporated with the newly formed kingdom of Belgium in 1831. The surface is flat, and the soil well cultivated for agricultural purposes. Its capital is Bruges. Area 1249 sq. m.

Pop. 880,000. Westgate-on-Sea, a watering-place, Kent, England, 2 m. W. by S. of Margate. Pop. (1911) 3000.

West Ham, a parl, and co. bor, of England, and an eastern Essex. suburb of London. It adjoins East Ham. Pop. (1911) 289,030.

West Hartlepool, see Harrlepool.
West Haven, a tn., New Haven co.,
Connecticut, U.S.A., separated from
New Haven by the West R.; has
manufs. of tools, motor-bonts, and
musical instruments. Pop. (1910) 8543.

West Hoboken, a tn. of Hudson co., New Jersey, U.S.A., about 2 m. W. have largely increased since their of New York, and adioining Jersey emancipation, and quite two-fifths of City and Hobok

are silk and cmb 35.403. Westhoughtor . '

England, situa and Wigan, 5 r are large collierie Pop. (1911) 15.0 West Indies, a

ofestant, but ing from the America) to within 7 in. 01 the religion of Yenezuela (S. America). It was so of Spanish descent. In Jamalea and believed that the islands formed the western limits of India. The total area is nearly 100,000 sq. m., of which are is nearly 100,000 sq. m., of which are of British descent.

1 ofestant, but of requirements of Spanish descent. In Jamalea and the other British islands the white are of British descent.

2000 cm. are independent, 12,300 Indies is of great variety and richness. 72,000 sq. m. are independent, 12,300 British, 3750 United States, 1350 British, 3750 United States, 1350 The sugar cane and tobacco plant are french, 430 Netherlands, 140 Danish, and extensively grown, and among other and 90 Venezuelan. The archipelago

have the franchise. Pop. 311.282. Puerto

the See works by Favene (1887), Calvert Bahamas, which are entirely British; (1894, 1897), Chambers (1897), and the Lesser Antilles, which are divided among the United Kingdom, France, Denmark, the Netherlands,

Venezuela, and the United States.
Relief and hydrography.—The Bahamas are partly of coral forma-tion and generally low. There is There is practically no running water, though there are ample underground supplies. In the W. of Cuba are the Sierra de los Organos reaching a height of over 2500 ft., and at the extreme eastern end of the island is a range of mounend of the Emini is a range of mountains facing S., the Sierra Maestre (4000 ft. mean altitude), but the island is divided into two parts by a large marshy depression 47 m. wide, between the N. and S. coast. In consequence of Cuba being largely composed of limestone the drainage is partly underground, and many rivers are lost in swamps. Hispaniola (San Domingo and Haiti) is generally mountainous, the highest summit exceeding 10,000 ft. Puerto Rico is an elevated plateau with a large number of rivers. In Jamaica the Blue Mts. exceed 7000 ft., but in the centre and W. is a limestone plateau with deep valleys with self-contained drainage. S. of Puerto Rico the islands form a deeply submerged mountain ridge separating the Caribbean Sea from the Atlantic Ocean. This is generally mountainous and partly volcanic, and is covered with dense forests.

Climate, -There is considerable uniformity of temperature throughout the year. A double rainy season generally occurs in May and October, February and March being the driest months.

is been also a coolies from n the planta. Puerto Ilico · ty, but they in the other nctically the regro. The iegro. otestant, but

Indies is of great variety and richness. The sugar cane and tobacco plant are Guinea corn. Forests are numerous gether constitute the British metro-and wide-spreading, and produce polis, is also, perhaps, the most im-valuable woods and delicious fruits. portant, for it contains the royal Palms are in great variety, and there are several species of gum-producing ture, the supreme courts of law, the chief public offices of the executive estimated to have attained an age of government, and the magnificent 4000 years, and are of immense height and bulk. There are few marginals some of the relative part of the and bulk. There are few mammals. but there are plenty of wild dogs and pigs, as well as opossums, muskrats, and armadillos. Water fowl and various kinds of pigeons are in abundance, and there are many parrots and humming birds. Among domestic animals mules are largely reared, have been destroyed by the Danes and, where possible, cattle-breeding is about the time of Alfred, but it was received. practised. Goats abound, and large flocks of sheep are kept. Pop. about 6,500,000. See articles relating to

the various islands.
Westinghouse Brake, see BRAKE. Westland, western coast prov., South Is., New Zealand, lying between the Southern Alps and the Pacific Occan, and between Grey R. in the N. and Big Bay in the S. Area 4640 Eg. m. There are extensive gold deposits and some coal. Chief towns, Greymouth and Hokitika. Pop.

Greymouth and Hokitika. Pop. 14,700.

Westmann Islands, lie off the S. coast of Iceland. Many of them are uninhabited. The chief industry is

fishing. Pop. about 1400.

Shannon, others include Lough Known as Henry VIL's chapel. Sheelin and Lough Kinale. There are: This was the last important alterano great elevations, the greatest tion or addition made to the abbey heights being Knocklayde (795 ft.) until early in the 17th century, and Hill of Ben (710 ft.). The prinder the direction of Sir Christopher Inny, and the Boyne with their tribution. Wren. Since that time much renovatives. largely carried on. Some friezes and the length of the nave is 154 ft., and coarse woollen materials are manulitation. The church of the length of the nave is 154 ft., and coarse woollen materials are manulitation. The church of the length of the nave is 154 ft., and coarse woollen materials are manulitation. The church of the length of the nave is 154 ft., and the length of the nave is 154 ft., and coarse woollen materials are manulitation. The church of the length of the nave is 154 ft., and coarse woollen materials are manulitation. The church of the length of the nave is 154 ft., and the length of the nave is 154 ft., and the length of the nave is 154 ft., and the length of the nave is 154 ft., and the length of the nave is 154 ft., and the length of the nave is 154 ft., and the length of the nave is 154 ft., and the length of the nave is 154 ft., and the length of the nave is 154 ft., and the length of the nave is 154 ft., and the length of the nave is 154 ft., and the length of the nave is 154 ft., and the length of the nave is 154 ft., and the length of the nave is 154 ft., and the length of the nave is 154 ft., and the length of the lengt

some of the noblest and greatest of Englishmen have been interred. The city appears to have owed its origin to a church erected here by the Saxon rebuilt by Dunstan in the reign of Edgar and established about 958 as a Edward the Confessor W. was the residence of royalty, and Edward's palace seems to have been on or near the site of the present houses of Parliament. This monarch rebuilt the abbor, with great mention. abbey church with great magnifi-cence, and, on his decease, was in-terred within its walls. After the Conquest, Westminster continued to be the usual residence of the Kings of England, and in the abbey church of St. Peter they were usually crowned. William Rufus built a hall as a banqueting-room to the palace, and this, restored by Richard I., is the present W. Hall. Henry III. began to re-Westmeath, an inland co., prov. W. Hall. Henry III. began to reLeinster, Ireland, bounded N. by
Cavan, S. by King's co., E. by Meath,
and W. by Roscommon. The surface
is varied and is some 250 ft. above
sea-level; it is a county of loughs, and
contains some very fine scenery. The
largest of these is Lough Ree on the
Shannon, others include Lough
Sheelin and Lough Kingle. There are This was the last important, afterathe soyne with their triou-i Wren. Since that time much renova-taries. The Royal Canal cuts through tion has been carried out, but no the county, affording easy communi-additions have been made. The ex-cation with Dublin. Agriculture is the staple industry and dairy farming is 9 in. The extreme breadth is 220 ft., largely carried on. Some friezes and the length of the nave is 154 ft., and

Grosvenor. from the Grosvenors of Eaton, near Chester, and traces its origin back to

the conquest.

Westminster Assembly of Divines, a Puritan assembly, which sat from Aug. 1643 to Feb. 1649, in order 'to confer and treat among themselves of such matters and things touching and concerning the Liturgy, discipline and government of the Church of England, or the vindicating and clearing of the doctrine of the same.' On April 20, 1644, it submitted to Parliament its Directory for Public Worship, while the first part of its Confession of Faith was presented in Oct. Both these documents and the 1644. Shorter and Larger Catechisms were ratified and approved by the General Assembly of the Church of Scotland, and still remain the authorised standards of that establishment. The Assembly also attempted to set up Presbyterian system of church vernment in England, but all government in its work was swept away at the Restoration.

Westminster Gazette, the leading London Liberal evening daily paper, established in 1892 by the late Sir (then Mr.) George Newnes. Its outstanding features were the strong and ominently seasonable front-page articles on the dominant political issue of the day; the brilliant cartoons of 'F.C.G.' (see GOULD, FRANCIS CAR-RUTHERS), and the masterly reviews in the Saturday edition of literature, fine arts, and other matters of current interest. Mr. E. T. Cook was its first nterest. Air. E. T. Cook was its first editor, but retired after a few years in favour of Mr. J. A. Spender, one of the foremost Liberal political writers of the day. The W. G. is now owned by a group of leading Liberals.

Westmorland, a N. co. of England, bounded on the N.W. by Cumberland, and W. by Lengeshire and E. by

S. and W. by Lancashire, and E. by Yorkshire, W. comprises a con-Yorkshire. siderable part of what is known as the fell country and also of the lake district. The mountainous region, with its great tracts of moorland, affords some magnificent scenery and includes the heights of Crossfell (3000 ft.), Milbourne Forest (2780 ft.), Helvellyn (3118 ft.), and many others; while the lakes include Windermere, Ullswater (in part), Grasmere, and Hawes Water. The principal rivers Eden, running through the what is known as the Vale of Eden, Throughthe Lune, and the Kent. out the lake district there are crags

The family is descended | cattle being raised in large numbers-Oats is the main crop; granite, slate, and limestone are quarried and lead The manufactures found. unimportant, and include woollen goods, paper, and bobbin making. The principal towns are Appleby, the county town, and Kendal; the county returns two members to parliament. There are ancient castles at Appleby, Brough, and other places, and the ruins of Shap Abbey. W. suffered from the invasions of the Scots in ancient times, Appleby being twice sacked and burnt. During the Civil War the county was royalist, but later espoused the Jacobite cause. The area is 790 sq. m. Pop. (1911) 63,575.

West New York, a tn. in Hudson co., New Jersey, U.S.A., connected by ferry with New York. Its chief manufactures are silk, sugar, cotton Pop. (1910) seed oil, and rubber.

Weston, a parish and village of Somersetshire, England, 2 m. N.W. of Bath, of which it practically forms a suburb. Pop. (1911) 5000.

Weston-super-Mare, a watering-place of Somersetshire, England, on the Bristol Channel, at the foot of Worlebury Hill, 184 m. S.W. of Bristol. The town has a fine esplan-ade and public gardens, potteries, mineral springs, and fisheries. Pop. (1911) 23 23 23 5 (1911) 23,235.

West Orange, a tn. of Essex co., New Jersey, U.S.A., adjoining Orange co., and 13 m. W. of New York City. th was only chartered as a town in 1900. There are phonograph, lawn-mower, and felt-hat manufactures.

Pop. (1910) 10,850.

Westphalia, a prov. of Prussia, bounded on the N. by Hanover, on the Hanover,

Hanover,

Hessethe S.

and s.w. by necessar an and the Rhine Province, and on the N.W. by the Netherlands. It has an area of 7801 sq. in. and a length and breadth of about 130 m. The S. of the province is mountainous. being diversified by the Schieferge-birge and the hills of Sauerland, and farther N. occur the Erzegebirge and the Teutoburger Wald, on each side of which lie portions of the great plain of N. Germany. On the S.W. is the wide 'bay 'of Münster, and on the N.E. the yalleys of the Weser and the Werre. Other rivers are the Ems. Lippe, Ruhr, Sieg, Eder, and Vechte. The climate is temperate except in the S., which is cold in winter and has Other rivers are the Ems. out the lake district there are crass and soars and also a number of the climate is temperate except in the S., which is cold in winter and has for the most part cold and wet, and only about half of the co. is under cultivation, and of this the greater part is devoted to pasturage, sheep and beans, and swine are reared in

West

the chief are coal and iron; the former being found in the great Ruhr
coalfield, which extends from the
Rhineland into the province as far as
Runa, the centre being Dortmund,
unna, the centre being Dortmund,
and there is a smaller coalfield in the
N. at Ibbenbüren, the latter occurring
in the Schiefergebirge and the Ruhr
coalfield. Besides these, zinc, lead,
coalfield. Besides these, zinc, lead,
coalfield, grant polar and and the prov. of
in the Schiefergebirge and the Ruhr
coalfield. Besides these, zinc, lead,
coalfield, grant polar and and the prov. of
in the Schiefergebirge and the Ruhr
coalfield. Besides these, zinc, lead,
coalfield and there is a smaller coalfield in the
N. by the Baltic, S.
by Russian Poland and the prov. of
posen, E. by E. Prussia, and W. by
the provs. of Brandenberg and Pomecoalfield posen, in the N. by the Baltic, S.
by Russian Poland and the prov. of
posen, E. by E. Prussia, and W. by
the provs. of Brandenberg and Pomecoalfield. Pop. 4090.

West Prussia, a prov. of Prussia,
situated in the N. by the kingdom,
with an area of 9862 sq. m. It is
bounded on the N. by the Baltic, S.
by Russian Poland and the prov. of
posen, E. by E. Prussia, and W. by
the provs. of Brandenberg and Pomecoalfield. Posen, E. by E. Prussia, and W. by
the provs. of Brandenberg and Pomecoalfield in the N.E. of Bullic, S.
by Russian Poland and the prov. of
posen, E. by E. Prussia, and W. by
the provs. of Brandenberg and Pomerania. The coast is indented by the
Gulf of Danzing, into which the Vistual flows. The province is divided into the two administrative districts
of Danzing and Marienwerder, and
sends twenty-two representatives to
factures are extensively carried on,
the Lower House and thirteen to the
Reichstag. Agriculture is the chief
industry, but there are many manufactures. Pop. 1.641,574.

West Seneca, a tn. on Lake Erie,
U.S.A., 4 m. S.E. of Buffalo. Pop.
(1910) 4605.

West Seneca, a tn. of Hampden
coalfield in the N.by the province is divided into
the Lower House and thirteen to the
com Münster for its capital. The province was constituted in 1815. 4,125,904.

West Pittston, a tn. of Luzerne co., Pennsylvania, U.S.A., on the Susque-hanna R., 10 m. S.W. of Scranton, has machine and cut-class works, silk mills, and anthracite mines. Pop.

(1910) 6848.

West Point, a military post in Orange co., U.S.A., on the Hudson R., 50 m. N. of New York. The U.S.A. Military Academy was established here in 1802, and occupies an area of 31 sq. m. It comprises barracks for codets, buildings for military exercises, museums, an observatory, chapel, and hospital. The military library is one of the finest in existence. and contains, in addition to its \$0,009 vols., memorials to Edvar Allan Poe and F. M'Neill Whistler, former cad-ets. West Point was occupied by the Americans as a military post during the Revolution and was strongly fortified. It was also, for a time, the headquarters of Washington, who headquarters of Wa-hington, who ders prot. Belgium, on the Scheldt, recommended it as a site for a milistary school, which was established as manufactures. Pop. 16.509.

carly as 1794. Constitution 1s. was added to the po.t in 1998.

Westport: 1. A seaport in Clew Grindelwald, about 12 m. from Inter-Bay, Mayo co., Ireland, 12 m. S.W. laken. It consists of three peaks, of

large numbers for Westphalian hams. of Castlebar, connected by steamer The breeding of horses is also carried, with Glasrow and Liverpool. The on and the rearing of cattle and goats chief industry is agriculture. Pop. is important. But the wealth of the (1911) 3809. 2. A tn. on the W. oast province lies in its minerals, of which of South Is., New Zealand. It has a the chief are coal and iron; the for- fine harbour and is a shipping port for mer being found in the great Ruhr coal and gold. Pop. 4000.

Devonshire, Endand, on Bideford Bay, 21 m. N.W. of Bideford. It takes its name from Charles Kings-ley's novel. It has a military college founded 1874) and famous golf-links on Braunton Burrows.

Wet, De, and Wette, De, see Dr. Wer and De Werre.

Wetaskiwin, a tn. of Alberta, Canada, 40 m. S. of Edmonton, the centre of an extensive farming region.

Pop. 4000.
Wetheral, a par. and vil. of Cumberland, England, on the Eden, 4 m. S.E. of Carlisle; has the ruins of a Benedictine abbey (1088). Pop. Benedictine (1911) 2555.

Wetherby, a market tn. of the W. Riding of Yorkshire, England, on the Wharle, 6 m. S.E. of Harrozate; has brewing industries and a cattle market. Pop. (1911) 16,210.

Wetherell, Elizabeth, see Warner,

SUSAN.

Wetter, Lake, see VETTER.

Wetteren, a market tn. of E. Flan-

which the middle, or Mittelhorn, is marble is quarried the highest (12,166 ft.). The other towns are Wexford (the content of the content of t two are known as the Hasli Jungfrau (12,149 ft.) and the Rosenhorn (12,110 ft.). The mountain was ascended first in 1844, and frequently since, the ascent being made from Grindelwald. The neighbourhood of the Wetterhorn is particularly attractive to artists, the contrast between the bright pastures and the black precipices and dazzling snow ridges being remarkably striking.

Wettin, House of, a German reigning family dating from about the mid-10th century. It has given rise to several European royal houses. Ernest I. (1784-1844), who first assumed the title of 'Saxe-Coburg-Gotha' (c. 1826), was a descendant. Dedo I. (d. 1009), son of Dietrich (d. 982), first gained possession of the county of W. His son, Dietrich II., married a daughter of the Margrave of Meissen. Under their grandson, the county I. (d. 1103), the importance and extent of the dominions of the H. of W. increased greatly, lower Lusatia and the mark of Me. H. of W. increased greatly, lower Lusatia and the mark of Me. Semicondant of the dominions of the Lusatia and the mark of Me. Semicondant of Meissen. Under their grandson, and extent of the dominions of the Lusatia and the mark of Me. Semicondant o Naumberg became their Conrad I. and his descendants rulers from 1123-1288, when sold to the Archbishop of Magdeburg, received its first charter in 1318. It He retained them till the peace of vetures one member to parliament. Westphalia (1648); the Elector of Brandenburg then claimed them, and they were finally appared to Bread Wey, a riv. of Hampshire and they were finally annexed to Prussia (Saxony).

Wetzlar, a tn. of Rhine prov., Prussia, at the confluence of the Dill and Lalin, 64 m. N.E. of Coblenz by rail; has iron mines, foundries, and manufactures of gloves and optical in-struments. Goethe wrote here the Sorrows of Werther, 1772.

13,400. Wexford: 1. A maritime co., prov. Wexford: 1. A marltime co., prov. Leinster, Ireland, bounded on the N. by Wicklow, S. and E. by St. George's Channel, W. by Waterford and Kilsenny. The surface is hilly in the N. and W., the greatest heights being reached in Mt. Leinster (2610 ft.) Blackstairs Mt. (2409 ft.). Owing sandbanks the coast is danger and the only opening of imports is Wexford Harbour and Bay, w Waterford Harbour divides it fithe county of that name in the S. the county of that name in the S.
the coast to the S.E. is Tusker R
with a lighthouse, and further S. are
with a lighthouse, and further S. are
the Saltee Is., beyond which there is
a lightship. The principal rivers are
the Barrow and the Slaney, both
navigable for a long distance. Agriculture is successfully carried on, and
culture is successfully carried on, and
culture deaths are reproducing in prepare. the county of that name in the S. navigable for a long distance. Agriculture is successfully carried on, and
sheep and cattle are reared in increasing numbers. Barley is the main crop,
the fisheries are important, and some

The principal towns are Wexford (the county town). New Ross, and Enniscorthy. county returns two members to parliament. There are a number of fine old ruins in the county, including Dumbrody Abbey, Ferns Abbey, and the castles at Ferns and Enniscorthy. The area is 901 sq. m. Pop. (1911) 102,287. 2. A municipal bor, and seaport, cap. of co. Wexford, Ireland, on the R. Slaney, its importance is mainly on account of the harbour, which is formed by the estuary of the river, but owing to a bar across the mouth big vessels are unable to enter at ebb tide, and in consequence the harbour of Rosslare was built and connected by rail with W. (8 m.). The town contains the ruins of St. Sepulchre's Abbey and some frag-ments of the old town walls, and the

n was besleged garrisoned by I was the head-

Wey, a riv. of Hampshire and Surrey, England, rises near Alton in Hampshire, and flows N.E. past Godalming and Guildford to join the Thames at Weybridge. Length

Weybridge, an urban dist., Surry, England, 19 m. W.S.W. of London by rail, at the junction of the Wey and the Thames. W. is mainly a residential town. The Brooklands racing the surrection of the Wey and the Thames. track was opened here in 1907, for motors and aeroplanes. Pop. (1911) 6286.

Weyburn, a tn. in Southern Sas-katchewan, Canada, which of recent years has grown considerably us a industrial centre.

on route from the o Western Canada. depality voted for of \$285,000 for new The Cleveland ompany have large ch they employ 200

are the 'Magi' triptych (1450), 'The '1845), an English politician, entered Crucifixion,' Expulsion from Paradise,' and 'The Last Judgment' Tory, but ultimately voted for the (Prado Gallery), several Madonnas, and 'St. John the Baptist' (Frankfort), See Life, in German, by Hasse Wharncliffe Meeting, so called after the council of the council (1841) under Pecl.

(1905).

Weymouth and Melcombe Regis: 1. A scaport, watering-place, market-town, and municipal borough, Dortown, and municipal borough, borsetshire, England, at the mouth of Dorchester. W. the Wey. 8 m. S. of Dorchester. and M. R., on opposite banks of the river, are connected by bridges. Weymouth Bay is shut in on the S. by the Isle of Portland. The chief industries are the quarrying of Portland stone, shipbuilding, sail and ropemaking, brewing, and fishing. Pop. (1911) 22,325. 2. A township, Norfolk co., Massachusetts, U.S.A., 12 m. S.S.E. of Boston, manufs. boots and shoes and nails. Pop. (1910) 12,895.

Whale, the name for most of the members of the order Cetacea, which are relentlessly persecuted for the oil, whalebone, spermaceti, ivory, etc., which they yield. Ws. are the most thoroughly aquatic of all mammals, the fore limbs being reduced to fin-like paddles and all external traces of the hind limbs having virtually disappeared. They occur in all seas and by loose attachment of the ribs are able to expand the chest and remain a long time under water. When they rise to the surface, the heated air expelled condenses and forms a column of spray. The whalebone Ws. still develop rudimentary teeth before birth, but then these are displaced by a large number of flattened plates of bone or baleen fringed at the edges, which strain the food from the water. Whalebone is derived principally from the right W., and being strong, light, and flexible has many uses. Most Ws. are inoffensive creatures and generally swim in herds. Whalebone is absent from the toothed Cetaceans, which include not only the dolphin, porpoise, and narwhal, but also the cachalot, or sperm W., the bottlenose, and beaked Ws.

Whangarei, a town, Whangarei co.,

North Is., New Zealand, on Whan-garei Bay, 80 m. N.W. of Auckland; produces coal, timber, and fruit.

Pop. 2500.

Wharf (Old Eng. hwerf, a turningplace or breakwater, from hweorfan, to turn), a platform or bank used for

Wharncliffe Meeting, so called after originator, Lord Wharncliffe (1776-1845), is a meeting of the shareholders of a railway or any public company, summoned to obtain their consent to a bill affecting their powers, under Standing Orders 62 to 66 of the House of Lords.

Wharton, a par., Cheshire, England, near the R. Weaver, 21 m. N.W. of Middlewich; has a large salt industry, boat-building, and artificial

manure manufs. Pop. (1911) 3300. Wharton, Philip Wharton, Duke of (1698-1731), the only son of Thomas, Marquess of Wharton, who died in 1715. Philip went abroad in 1716, and vowed allegiance to the Pretender, who created him Duke of Northumberland and gave him the Northumberland and gave him the Garter. In the following year he returned to England, and submitted to George L, who created him Duke of Wharton. He opposed the atainder of Atterbury (1723) and shortly after again joined the Pretender, and later entered the Spanish carries and fought before Cibrolta. service and fought before Gibraltar. There is a biography by Lewis Melville (1913).

Wharton, Thomas Wharton, Marquess of (1640-1715), a statesman, was a prominent supporter of the Revolua prominent supporter of the Revolution of 1688. He is the reputed author of Lilli Bulero, Bullen-a-la. He was a commissioner for the union with Scotland, 1706, and in that year was given an earldom. He was lordlieutenant of Ireland from 1708-10. when Addison was his secretary. He was one of those who proclaimed

was one of those who proclaimed George I. as King of England, and was rewarded with a marquisate.

Whately, Richard (1787-1863), an archbishop of Dublin, born in London and educated at Bristol and Oxford, becoming a fellow of Oriel College. He was one of the founders of the Broad Church School, and favoured unsectarian religious education. Among his works are: Christian Among his works are: Christian Evidences, Peculiarities of the Chris-tian Religion, The Kingdom of Christ, Logic and Rhetoric. See Jane Whately, Life and Correspondence; and Fitz-

patrick's Memoirs.

Wheat, or Triticum, a grass, the origin of which has not been definto turn), a platform of bank used for origin of which has not been deam loading and unloading goods from the vessels in a harbour or river.

Wharfe, a riv., W. Riding of Yorkshire, England, rises on Cam Fell, and flows S.E. to join the Ouse near Cawood. Length 60 m.

Wharneliffe, James Archibald Stuart Wortley Mackenzie, first Baron (1776-spikelets produce only a single ripe 546

grain. It is sometimes cultivated on poor soils, in mountainous districts of Central Europe. Polish W. (T. Polonicum) has awned glumes, which enclose all the flowers in the spikelet, only two of which are fertile. The grain is large and very hard; the crop is grown in Southern Europe, but is unsuited to British climate. Trilicum satirum is divided into three cum saturum is divided into three races: (1) Ordinary spelt Ws., grown on poor soils, in Central Europe; (2) Two-grained spelt Ws., grown in S. Europe chiefly for the manufacture of starch; (3) T. satirum tenax, which has given rise to all the most important varieties, classified in four cult process against a facility of the control sified in four sub-races, each of which is commonly regarded as a separate species. Hard or flint W. (T. durum) is grown around the Mediterranean chiefly for making macaroni; Turgid or rivet W. (T. turgidum) produces red grain with very tall stiff straw, used for thatching purposes. The grain makes dark coloured flour, and is too poor in gluten for bread-making. Dwarf Ws. have short stiff straw with small grains: Common W. (T. vulgare) includes all more important varieties grown in the great W. districts. Winter Ws. are sown in autumn, and spring varieties usually in February. The average yield in Britain is about 29 bushels per acre. For diseases see Bunt, Hessian Fly, RUST, and SMUT. Sec also FLOUR. and Professor Percival, Agricultural Rotany.

Wheatear, Fallow Chat, Fallow Finch, or Saxicola enanthe, a summer migrant to Britain, often arriving in February. It is about 6 in. long, grey on the upper parts with a black streak from beak to car and with black quill feathers, wing coverts, and tail feathers. In flight a white patch on the lower back and tail is conspicuous. The underparts are white with a buff tinge on the breast. Its food consists chiefly of insects, and towards the end the summer the birds, which are then plump and in good condition for the migration, are snared in considerable numbers

for the table.

Wheat Fly, see HESSIAN FLY.

Wheatley, a par. and urban dist., W. Riding of Yorkshire, England, 2 m. N.E. of Doncastor. Pop. (1911) 5363.

Wheaton, Henry (1785-1848), an

thieves, highwaymen, felons, and the like. It existed in ancient times in Greece and Rome, and was first employed in France in 1534. One mode employed was to stretch the criminal on a wheel with his hands and legs bent downwards along the spokes. The wheel was then turned so that the victim's limbs broke, while the bones of his body were broken with blows. At other times the corpse was exposed to public view on a wheel, the man having previously

been beaten to death.
Wheel and Axle, a machine consisting of two cylinders on a common axis terminating in two pivots; one cylinder is of relatively small dismeter and is called the axle, the other is larger and is called the wheel. Both have ropes coiled round them in opposite directions. The power is applied to the rope attached to the wheel, and as it uncoils the other rope is coiled round the axle, thus lifting the weight round the axie, thus mining the vegan-attached to it. The conditions of equilibrium is that the algebraic sum of the moments of the forces about the axis is zero. Thus, if P be the power acting downwards, W the weight being pulled upwards, b the radius of the wheel and a the radius of the axle. then Pb = Wa, from which we get the mechanical advantage, i.c. the ratio of weight to power = the ratio of the radius of the wheel to that of the axle. Examples of the machine are the water-wheel, the windlass, the handle constituting the wheel, and the capstan, the series of spokes constituting the wheel.

Wheel Animacules, see ROTIFERA. Wheeler, Joseph (1836-1906), an American soldier, born in Augusta, Georgia. He entered the Confederate service in 1861, and took part in the first campaigns in Kentucky and Tennessee, winning special fame in the battle of Shiloh (1862). He further distinguished himself in 1863 at Chattanooga Valley, and in 1865 as lieutenant-general commanded the cavalry in General Johnson's army until the end of the war. 1898, having served as a democrat in Congress (1881-89), he was appointed major-general of volunteers and placed in command of the cavalry division of the army of Santiago the war with Spain, and from 1890-1900 commanded a brigade in the Wheaton, Henry (1785-1818), an Imajor-general of volunteers and American jurist, born at Providence, Rhode Is. He was editor of The National Advocate in New York, practised there as justice of the marine court, was reporter for the United States supreme court, charge d'affaires at Copenhagen (1827-35), History of Cuba, 1496 to 1859; Military History of Alubama; History of Chapaign; Cavalry the Santiago Campaign; Cavalry

Tactics; Account of the Kentucky 4 m. S.W. of Gateshead; has coal-Campaign; History of the Effect upon mines, iron, steel, and chemical Civilisation of the Wars of the 19th works. Pop. (1911) 18,332.

Century.

Wheeler, William Almon (1819-87), Wheeler, William Almon (1819-87), an American legislator, born at Malone, New York. He was called to the bar in 1845 and practised in Franklin County. He was a member of the New York Assembly (1858-59), acting as president pro tempore, and in 1860 was elected to Congress, being re-elected in 1869, when he served until 1877. He took a prominent part in the adjustment of Southern part in the adjustment of Southern affairs under the Reconstruction Act, and settled the political difficulties in Louisiana by the well-known 'Wheeler Compromise.' He was vice-president of the U.S.A. under Hayes (1877-81).

Wheeling, a city and co. seat of Ohio co., Virginia, U.S.A., 46 m. by rail S.W. of Pittsburg, on the Ohio manufs. iron, steel, tobacco, foundry and machine-shop products, lumber, glass, and pottery. (1910) 41,641. Pop.

Wheel-lock, see FIREARMS. Whelk, or Buckie (Buccinum undatum), a common mollusc off British coasts, much used as an article of food. The shell is grey or brownish white, spirally grooved and with numerous raised ridges. There are other species to which the name is also applied. The name dog whelk is commonly given to Purpura lapillus, and also to Nassa reticulata.

Whetstone, George (c. 1544-87), a poet and prose-writer, born probably in London, dissipated his fortune at court and in reckless living, went to France, entered the English army, then talk well the property of the court and t then took up literature as a profession. He collected his verses into a volume called Rocke of Regard; wrote a play Promos and Cassandra, and after an Italian visit, a collection of prose romances; also A Mirour for Mayestrates, and various biographical elegies.

Whetstones, see Hones. Whewell, William (1794-1866), an Whewell, English philosopher, born at Lancaster, became a fellow, later master, of Trinity College, Cambridge, and finally vice-chancellor of the university. Among his works are: Hist. of the Inductive Sciences, Philosophy of the Inductive Sciences, Philosophy of the Inductive Sciences, Elements of Morality, Plurality of Worlds, etc., and translation of Goethe's Hermann und Dorothea, See Todhunter's Whewell, and Life by Mrs. Douglas. of

Whey, the watery part of milk, Whip-snake, see DRYOPHIS.

scparated in cheese-making. It is Whirlpool, a vortex or eddy in utilised in the manufacture of milk- water caused by the inter-action of two or more currents of different

Whidah, or Whydah, one of the chief towns of Dahomey (q.v.).

Whig, formerly the designation of one of the great political parties in England. The term is of Scottish origin, and was first used in Charles II.'s reign. According to some, it was derived from whiggamores or horse drovers, and applied as a term of contempt, in allusion to the march of the people headed by the clergy to Edinburgh after the defeat of the Duke of Hamilton in 1648-to all who opposed the court. In England it was assumed as a party name by those politicians who took the lead in placing William III. on the throne. See Political Parties.

Whimbrel, see Curlew. Whin, see Furze.

Whinchat, or Saxicola rubdra, a pretty bird that visits Britain in summer, favouring heaths and open places, where it feeds principally on insects. It resembles the stonechat in plumage except in its white steaks

on the head.

Whippet, a favourite dog, particularly in the N. of England, where it is much used for running races, being capable of tremendous speed; it is trained to make for the towel held at the end of the course by its owner. It is bred in various colours, including black, red, white, fawn, and brindle. and its appearance is that of a greyhound in miniature. Its head is long and lean, with small rose-shaped ears. long muscular neck, deep capacious chest, long back, arched over the loins; the fore legs are moderately long, and the hind quarters strong and broad with muscular thighs; the tail is long and tapering

Whipping, see under Flogging or

WHIPPING.

Whippingham, a par. and vil., Isle of Wight, England, 4 m. N.E. of Newport. The parish contains East Newport. The parish contains East Cowes, Osborne House, and the church of St. Mildred with memorials to Queen Victoria, the Prince Consort, Prince Leopold, and Princess Alice. Pop. (1911) 850.

Whip-poor-will, or Antrostomus rociferus, a N. American goatsucker, so called from its cry during the nights of its breeding season. It is about 10 in. long, mottled tawns in colour mith a white college. brown in colour, with a white collar on the throat and has long stiff bristles at the base of the bill.

sugar. See Cheese. two or more currents of different Whickham, an urban dist., Durstrength, often by the re-uniting of a ham, England, near the R. Derwent, current divided by an obstacle. Dan-

gerous Ws. may occur where tidal cur-, and a purer spirit is obtained, the per-

rents mingle on coasts; in myth and fiction the dangers are largely exaggerated, as in the case of Charybdis in the Straits of Messina and the Maëlstrom of the Norwegian coast. Their danger lies in rendering steering difficult during rough weather, and increasing the chance of driving on to In ancient times and the days of small sailing vessels they were dis-

tinctly to be avoided. Whirlwinds, are atmospheric vortices or eddles, the term being applied or tornadoes, but sufficiently marked to cause minor acts of damage. The essential feature of this type of diszontal diameter is exceeded by the height of the vertical axis. They are liable to spring up in deserts as dust-storms, or near the coast during anticyclonic weather. Some during anti-cyclonic weather. Some portion of the ground becomes more strongly heated than surrounding parts, the air in contact, being steady, rises in tem-perature, becomes less dense, and is driven upwards by incoming currents of cool air. The inequality in force of cool air. The inequality in force of these gives rise to the swirling motions, which may be either clockor anti-clockwise. When large size, a mile or so, and in humid weather, they may develop as small thunderstorms, or 'cloudbursts.' The lifting action is sometimes considerable, carts, trees, ctc., being bodily transported. The W in Kent, be-tween Walmer and Deal, Oct. 24, 1878, destroyed everything along a track 450-700 ft. wide and more than a mile in length. Sometimes the vertical height of the disturbance is quite small. Sir R. H. Scott, Elementary Meleorology, 1886.
Whisky, a spirit obtained by distil-

lation of the fermented extracts of lation of the fermented extracts of cereals such as barley, maize, oats, etc. Potatoes, rice, sugar, molasses, and beet are also used. The substances used are subjected to the processes of mashing, pitching, and fermenting and the resulting liquid called the 'wash 'undergoes distillation (see Brewing). In Scotland and Ireland the distillation is carried out in not-stills, which consist of large in pot-stills, which consist of large copper kettles or pots having a pear-shaped head and connected to a receiver by a copper worm which runs through a tub of cold water. The Scotch pot-still W. is almost entirely malt W. Irish pot from a mixed grist maize, and malt, the ing about one-third of the mixture, temeseen being the highest possible) Poteen or potheen is made in illicit scores one point; in short W., five

centage of fusel oil present in the silent spirit' produced being less than 0.05 per cent (see Coffer's Still). W. is generally blended when in bond. In pot-still W., fusel oil, which contains the higher alcohols and pyrocompounds like furfurel, is present to the extent of about 0.2 per cent. It was thought that during the maturing the fusel oil decomposed. This has since been found a mistaken idea and the cause of the increased flavour of the W. has been shown to be due to to those not so destructive as typhoons the interaction of the spirit with the v the casks from previously conturbance is that the length of the hori- colourless, and the colouring of the various brands is carried out by storage wine casks or by the direct addilago wine casks or by the direct addition of caramel or maturing wine. Pot-still W. varies in strength from some 15°-50° over-proof, while patentstill W. is generally 65°-70° over-proof. Much of the latter quality spirit is used for making methylated spirit, gin, brandy, etc., and for manufacturing and scientific purposes. For use as a beverage the patent-still W. is matured in casks for soveral years or carefully blended with pot-still W. Iu U.S.A. W. is made from malze or In U.S.A. W. is made from maize or rye, and the distillery states are Illinois, Indiana, Kentucky, New York, Ohio, and Pennsylvania. The imposition of the tax on distilled liquors in 1791 by the American Congress led to the Whisky Insurrection in W. Penn-sylvania in 1794. The abolition of the tax led to quiotness, but in 1812-15 the tax was re-imposed. In England

Whist

£18,511,392. Sec Alcohol, Brew-ING, COFFEY'S STILL, FERMENTATION, EXCISE, SILENT SPIRIT, FUSEL OIL. Whispering Places. Places like galleries or domes (c.g. that of St. Paul's Cathedral) of such a form that sounds produced in certain parts are concentrated by reflection from the interior walls to another distant part. The surface produces a perfect echo, so that even faint sounds become audible at a much greater distance than is usual under ordinary circum-

the tax was re-imposed. In England and other countries a heavy exciso

duty is levied on all distilled spirits. The revenue derived from the excise

on spirits in Great Britain in 1912 was

stances. Whist, a card game for four players or in the case of a 'whist drive' for number of sets of four players,

ject of which is to score tricks. trick made in excess of six

stills from sugar and molasses. In points make a game, and a score of England, W. is made in a patent still, two games out of three wins the whereby rapid distillation is ensured; 'rubber'; in long W. ten points

tion of a partnership as such taking a prize, because the individual players move from table to table according to the result of each hand. Partners holding all four honours fassuming the players elect to play for honours), i.e., the ace, king, queen, and knave of trumps, score four points; three honours score two points. In American W. seven points make a game, and honours are not counted. The game of W. is a very old one, and derives its name apparently from the Cornish huist (silence), from the supposition that it requires concentration and silence on the part of the players to play the game well.

Rules.—It is not proposed to do more here than notice those of the important rules which are less often observed. The deal commences with the player who cut the lowest card in the draw, and then passes on to the player on his left, and so on. If, whilst dealing, a card be exposed by the dealer or his partner, the others can claim a new deal, provided they have not touched their cards; and a card exposed by either adversary gives that claim to the dealer, provided his partner has not touched a The trump suit is determined card. The trump suit is determined by turning up the last card dealt, which, of course, falls to the dealer. Any player may at any time inquire what the trump suit is. All exposed cards are liable to be called and must be left face upwards on the table. be left face upwards on the table. The following are exposed cards: Two or more played at once face upwards; (2) any card dropped face upwards in any way on or above the table, even though snatched up so quickly that no one can name it; (3) every card named by the player holding it. If any player lead out of turn, his adversaries may either call the card erroneously led, or call a sult from him or his partner when it is next the turn of either of them to lead; but if, in spite of a lead out. to lead; but if, in spite of a lead out of turn, the other three players follow and complete the trick, the error cannot be rectified. In no case can a player be compelled to play a card which would oblige him to revoke, but the call may be repeated

make a game. In a W. drive the revoke cannot be claimed after the winners are those individual players cards have been cut for the ensuing who score the highest number of deal; but at the end of a hand, the tricks or points, there being no quest claimants of a revoke may search all claimants of a revoke may search all the tricks. If a player discover his error in time to save a revoke, the adversaries may call the card played in error whenever they think fit, or require the offender to play his highest or lowest card to that trick in which he has renounced; and any players who have played after him may withdraw their cards and substitute others. In whatever way the penalty be enforced, the revoker can under no circumstances win the game by the result of the hand during which he has revoked, nor can he score more than four. Dummy W. is played by three players. One hand called dummy's lies exposed. Dummy deals at the commencement of each other. He is not liable to penalties for revoke, as his adversaries see his cards. If he revokes and the error is not discovered until the trick is turned and quitted it stands good. If dummy's partner revokes, he is liable to the usual penalties. Dummy's partner may expose some or all of his cards, or declare that he has the game or trick without incurring any penalty; but if he lead from dummy's hand when he should lead from his own, or vice versa, a suit may be called from the hand which ought to have led. Double dummy is played by two players, each having a dummy or exposed hand for his partner.

Bibliography.—Cavendish on Whist; ames Clay, Treatise on Short Phist; Major - General Drayson, he Art of Practical Whist; Whist James

James Clay, Treatise on Short Whist; Major-General Drayson, The Art of Practical Whist; Whist (Club Series); and the Philosophy of Whist by Dr. W. Pole.

Progressive Whist and Gaming,—Progressive W. drives received a rude shock by the decision of the High Court in the case of Morris v. Godfrey (76 J.P. 297, 106 L. T. 890). Lord Alverstone's judgment emphasised the fact that the game was mlayed for money contributed by the played for money contributed by the players; and that the necessarily indiscriminate manner in which partner-ships were formed made the game practically one of chance. He did not decide and did not intend to hold that W. became unlawful merely because it was played for money. The de-cision, it is conceived, is clearly bad if it goes the length of saying that all W. drives are competitions in a game of chance. The predominance voke, but the call may be repeated if it goes the length of saying that at every trick, until such card has all W. drives are competitions in a been played. The penalty for a report of chance over skill must be proved of chance over skill must be proved in every individual case, and it would score, or an addition of three points to the adversaries' score, or a deduction of three tricks from the revoking player together with the addition considerable experience in the game, thereof to the adversaries' tricks. A In practice, club secretaries and

others need have nothing to fear if, in 1868. He also produced Reference prior to the opening of the drive, they announce that the ticket money will go to defray all expenses, and that they do not guarantee to give any prizes. If prizes are subsequently given by outsiders, it is difficult to see how the above decision could affect those who organised the drive.

Whistler, James Abbot M'Neill (1834-1903), a painter, lithographer, and etcher. He was born at Lowell, Massachusetts, and in 1851 he bender the military college came a cadet at the military college of West Point; but he soon decided to esponse art as a profession and accordingly, in 1856, he went to Paris and entered the studio of Gleyre. where Degas and Fautin-Latour were among his fellow-students. In 1859 he settled in London, but for a long time his work was little understood: and in 1877, when some of his nocturnes were shown at the Grosvenor & Gallery, they were so flercely assailed | r by Ruskin in Fors Clavigera that W. retaliated, suing his critic for libel, and at the same

The case result being granted

damages, but thr had shown himself a master of wit; and, 31 m. S and thenceforth till his death he was coal and from a middly hope in this cast he was widely known in this relation, even with his work as a painter. Much has been written about him subsequently, notably a biography by E. and J. rom Scarborough. The old and the Pennell (London), 1909; but the best account of the Ruskin trial is contained by a swivel bridge. In its famous by a swivel bridge. In its famous by a swivel bridge. tained in W.'s own book, The Art of making Enemies (L 1890), which embodies also

excellent critical comments on Whiston, William (1667-17) mathematical divine, a felle

Leicestershire, became a f Clare College, Cambridge. While chaplain to Moore, Bishop of Notwich, W. produced his first book, New Theory of the Earth. He became vicar of Lowestoft in Suffolk (1698), and in 1703 succeeded Newton as Lucasian professor at Cambridge, but in 1710 was expelled for his heretical opinions, which he was too honest to disguise. Among his works are:
Primitive Christiantly Revived, Life of Samuel Clarke, and a translation of Josephus. See his Measure. See his Memoirs. He was Jòşephus. possibly the prototype of Goldsmith's icar of Wakefield

Whitaker, Joseph (1820-95), a publisher, born in London; began business on his own account as a theological publisher in Pall Mall and later in the Strand. He published, with Delph, The Artal, to fine art review, edited

is familiar ack, begun Catalogue of Current Literature, which is continued, and published a few devotional works.

Whitbread, Samuel (1758-1815), an English politician, the son of a London brewer. Having studied at Eton, Oxford, and Cambridge, he entered parliament in 1790 as Whig member for Bedford, and attaching himself to Fox became a leading spirit in opposition to Pitt's government. headed the attack on Mclville in 1805, and two years later introduced an elaborate Poor Law Bill, and adopted a peace policy, which resulted in a party split and the practical disbandment of the opposition in 1809. He disapproved of the Regency Bill in 1811, and having made the acquaintance of the Princess of Wales

He died by his own hand.

Whitburn: 1. A par, and vil., Durm, England, 3 m. N. of Sunderd; is a much frequented sea-bathresort. Pop. (1911) 3300. 2. A. and vil., Valitheoushim. Seat. Snot.

4455

A.D. by St. (d. c. 680) 7. was held. red by the , and rebuilt cross was iory (1898).

While Wooden supponding, tope and sall Nor-making are carried on. W. is noted for its jet manuf., and its fisheries are important. Pop. (1911) 11,139. See History of Whiley by Charlton (1779). Young (1817); Atkinson, Memorials of Old While (1891). 2. Cap. and port of entry of Ontario. Co., Ontario, Canada, on Lake Ontario, 27 m. N.E. of Toronto. It has a good harbour. Saddlery and hardware are among the

manufs. Pop. 2300. Whitby, Daniel (1638-1726), an English divine and commentator, born at Rushden in Northampton-He became chaplain to the shire. Bishop of Salisbury (1668), probend-ary (1668), and precenter of Salis-bury (1672), and wrote a number of tracts against popery. His Protestant Reconciler (1682), advocating con-cessions to the Dissenters, was cessions publicly burned at Oxford. other works include: A Paraphrase

and Commentary on the New Testament, 1703, and Last Thoughts, 1727. Whitchurch: 1. A tn. in Hampshire, 12 m. N. of Winchester, with

agricultural interests. Shalloons and serges are manufactured. Pop. (1911) 1935. 2. A tn. in Shropshire, 19 m. N.E. of Shrewsbury; with malt works.

Pop. (1911) 5757. White, Sir George Stewart (1835-1912), a British soldier, born at Bally-mena, co. Antrim. In 1853 he entered the Royal Inniskilling Fusiliers.
Became captain (1863) and exchanged into the Gordon Highlanders, of which he later became colonel. Served which he later became colonel. Served with great ability in the Indian Mutiny and in the second Afghan War (1878-80), showing conspicuous bravery on several occasions. Accompanied Lord Roberts to Kandahar. Was awarded the V.C., made lieutenant-colonel and soon afterwards selected Except in the Syden World. Fought in the Sudan War colonel. of 1884-85 and in the Burmese Campaign of 1885. For his services in these wars he was made K.C.B. and major-general. In 1893 he succeeded Lord Roberts as Indian commander-in-chief, and in 1897 quartermaster-general of the forces. During the Boer War was unsuccessfully besieged in Ladysmith (1899-1900); was governor of Gibraltar (1900-4). See Life by Sir Mortimer Durand (1914). See

White, Gilbert (1720-93), an English clergyman and naturalist, born in the village of Selborne in Hampshire, received his education at Basingstoke under Thomas Warton, and at Oriel College, Oxford. He became fellow of his college in 1744, and held curacies at Swarraton and Sel-He accepted the living of Moreton Pinkney, a sinecure, in 1758, but lived near his native village of Selborne. Here his life became a round of tranquil observation nature, and in 1789 he published The Natural History and Antiquities of

Selborne, which had been in preparation since 1771.

White, Henry Kirke (1785-1806), a poet, born at Nottingham. Some contributions to a newspaper intro-duced him to the notice of Capel Loft, by whose help he brought out a volume of poems, which gained him the friendship of Southey. Thereafter friends raised a fund to send him to Cambridge. Overwork, how-ever, undermined his constitution and he died at twenty-one. Southey wrote a short memoir of him with some additional poems.

district attorney at Knoxville (1807), Notes, published posthumously (1913), judge of the Supreme Court (1809-15). Whitebait, the fry of herrings and and state senator (1807 and 1817). He sprats. In the winter and spring

was one of the commissioners to settle the Spanish Claims (1821-24), and was elected to the United States senate (1825-35, 1836-46). See Memoir by

Nancy Scott (1856).

White, Joseph Blanco (1775-1841), a British poet and theologian, born in Spain. Educated for the Roman m spain. Educated for the Roman Catholic priesthood, he came to England in 1810, and after studying theology at Oxford entered the Anglican Church, and finally became a Unitarian. He edited the Spanish monthly El Español, 1810-14; and Las Variedades, 1822. Among his chief works were: Evidence against Catholicism., 1825; Second Travels of an Irish Genlleman in search of a Period Catholicism. an Irish Gentleman in search of a Religion, 1834; Observations on Heresy and Orthodoxy, 1835; and his Auto-biography with Portions of his Correspondence (edited by Thom), 1845. His fine sonnet Night and Death first appeared in the Bijou (1828). W. also contributed to the Quarterly, West-minster, and Dublin University Re-views. See Blackwood's Magazine (July 1825), Brit. Quarterly Review (Aug. 1846), Academy (Sept. 12, 1891).
White, Richard Grant (1821-85), an

American author, born at New York. Intended for the church, he studied at New York, but turning to journalism, he contributed literary articles to the Courier and Enquirer. During the Civil War he wrote for the London Speciator, being of great service to His great disthe Federal cause. tinction is as a Shakespearcan scholar, his comments on the text being of great ability. See his Studies in

great ability. So Shakespeare, 1885.

White, Robert (1645-1704), an English engraver and draughtsman, pupil of D. Loggan. W. engraved the heading to the first Oxford Almanack (1674) and the title-plate to the Hist. of Oxford Antiquities. Vertue gives a long list of his portraits. His son, George (c. 1671-1734), was also an engraver and portrait painter. Both engraved portraits after Kneller. White, William Hale better known

as Mark Rutherford (c. 1830-1913), an English novelist, born at Bedford. His theological views preventing him from joining the Congregational ministry, for which he was intended, he entered the admiralty as a clerk, and rose to be assistant director of His works include: contracts. Autobiography of Mark Rutherford, and he died at twenty-one. Southey: 1881; Mark Rutherford's Deliverance, wrote a short memoir of him with 1885; and The Revolution in Tanner's some additional poems.

White, Hugh Lawson (1773-1840), Reuben Shapcott'; Catherine Furze, an American politician, born in 1893, and John Bunyan, 1905. See Iredell co., N. Carolina. He became his Early Life and Autobiographical district theorems to Know the Carolina was the control of the control

young sprats form the great proportion of what is sold under the name, between Trafalgur Square and the

Whiteboys, a secret Irish patriotic association, formed about 1820, and belonging to the group known as Ribbonism. It was condemned by the Catholic clergy, but only Catholics could belong, and they were all of the lowest classes. Their aims and methods varied in different parts of the country, and the movement died down about 1855. The Westmeath (1871)declared Ribbonism

See Sullivan, New Ireland. te Caps, see VIGILANCE White

SOCIETIES.

Whitechapel, a parl. dist. in the E. of London, including the bor. of Stepney. It is one of the poorest and most squalid parts of London. The most notable buildings in it are the Tower and the London Hospital.

Whitefield, a residential tn. of Lancashire, 6 m. N.W. of Manchester, with cotton manufs. Pop. (1911)

6967

Whitefield, Rev. George (1714---the founder of the Calvinistic Met dists, born at Gloucester, and c cated at Oxford. W. was ordai deacon by Bishop Benson (1736).

preaching made an extraordinary impression. After a visit to Gloucester and Bristol, he set off to join the Wesleys in America (1737). W. remained in America till towards the close of the year. He then returned with the view of raising subscriptions for an orphan-house in Georgia. Now began that course of preaching in association with Wesley which established Methodism as a popular faith. W. set the example of open-air preaching (1739) near Bristol. He repeatedly visited America, and repeatedly visited America, and traversed the whole extent of the British possessions. In 1748 he became known to Selina, Countess of Huntingdon, who made him one of her chaplains. This introduced him to the highest circles both of rank and literature in the metropolis. and Wesley quarrelled in 1741 about the great quest W. advocating W.'s printed we

of Clarke's Commentary on the Broce (1759), consist principally of scraions and tracts, a journal of his life and labours, and three volumes of letters. A collection of his sermons, tracts, and letters, in 6 vols., 8vo, was published at London in 1771.

White Flag, A, is carried in war as a sign of truce during hostilities, or Berrsmer.

as a token of surrender.

Whitehall, the main thoroughfare but in the summer, W. consists chiefly of young herrings. A W. dinner was customarily attended by cabinet members at Greenwich, and it was temporarily revived by Disraeli.

reign of Henry 111., and is low it. wide. Several public offices including the Treasury. Horse Guards. Admiralty, and War Office are at W. Whitehall, a tn. of Washington co., New York, U.S.A., on Poultuey R., and the Champlain Canal. It has railroad shops, silk and griet mills. Jumber mills and machine shops. The lumber mills and machine shops. The tn. also owns and operates the water-

works. Pop. (1910) 5869.

Whitehaven, a municipal and parl. bor., seaport and market tn., Cumberland, England, 41 m. S.W. of Carlisle; has extensive docks, collieries. iron-mines, breweries, tanneries, and stone-quarries. Pop. (1911) 19.018.

Whitehead, a scaport and vil., ivsborough .co., Nova Scotia, Guysborough co., Nova Scotia, Canada, on the Atlantic coast, 20 m. E.S.E. of Guysborough, is the first land seen by vessels bound for

Canada. Pop. 500.
Whitehead, Charles (1804-62), an English poet and novelist, author of The Solitary

us Autobio-), which led of the Pick-

in regular instalments by Dickens to Chapman and Hall the publishers. His novel Richard Savage (1842, new ed., 1896) was illustrated by Leech. Other works were: The Earl of Essex, 1813; Smiles and Tears (essays and stories. 1847); Life of Raleigh, 1851; and the unfinished Spanish Marriage.

Bell, A Forgotten Genius, 1884. Whitehead, Paul (1710-74), English satirist, born in London. While confined in the Fleet Prison for debt he wrote a number of political satires, and afterwards became one of the 'monks' of Medmenham Abboy. He was soverely satirised by Churchill. His own works include: State Dunces, 1733; Manners, 1730; and Gymnasiad, 1744. See collected edition of his works, with Life, hy

E. Thomson (1777).
Whitehead, William (1715-85), a poet laureate, wrote verses and plays. Pwo of his tragedies, The Roman Thomson (1777). Whitehead, William (1715-85), a Tather and Creusa, were performed at Drury Lane in 1750 and 1751, respectively, and a comedy. The School

for Lovers, in 1762. He was appointed poet laureate in 1757. His works were collected by William Mason (1788), who prefixed a memoir of his friend to the edition. Vale of the, see White Horse,

White Lady, a legendary spectre of

Teutonic tradition, said to appear in many of the German castles and elsewhere, by night or day, usually to presage the death of some member of the family. She is supposed to be the ancestress of the race and sometimes watches over the children at night. There are countless popular legends about W. Ls., who often appear to peasants and shepherds; they comb their hair, spin, disclose treasures, and make gifts which turn into gold or silver. There is a W. L. in Scott's Monastery, and Scribes' Monastery, and century as Dame Berchta, with whom

century as Dame Berchta, with whom other W. Ls. were identified.
White Lead, a basic carbonate of lead, having the formula 2PbCO₃, Pb(OH)₁. The compound is manufactured by several processes, the simplest of which consists in grinding litharge with water and sodium bi-carbonate. The Dutch process by which the best quality W. L. is prepared is carried out by placing spirals of sheet lead in pots at the bottom of which is vinegar, and covering with spent tan or dung for four or five weeks. The vinegar gradually evaporates by the heat generated by the tan and attacks the lead, forming a basic acetate. This is converted to W. L. by the action of the carbon dioxide evolved from the decaying W. L. is a heavy amorphous tan. W. L. is a heavy amorphous powder, which is used as a pigment. Although very poisonous and liable to blacken in the presence of sulphuretted hydrogen, it is used very largely, as no substitute has been found which possesses the same covering power or 'body.'

White Leg, 'Milk Leg,' or phlegmasia dolens, an inflammatory and dropsical disease of the legs caused

dropsical disease of the legs, caused by obstruction of veins or lymphatics, and characterised by painful swelling and a white appearance. It usually occurs in females after parturition, a thrombus being formed either by the slowing of the circulation in the lower limbs, or by the passage of an infective clot from the region of the uterus. In some cases the lymphatics only are affected, in some the blood-yessels only, and in others both comblined. The swelling may commence at the ankle and proceed upwards, or at the groin and proceed down-wards. Little can be done except constitutional treatment and fomentations to relieve pain.

Tentonic tradition, said to appear in | Civil War, he became Commissioner

tains in New Hampshire (N.E.). U.S.A., especially the Presidential range in Coos co. (S.), forming a detached portion of the Appalachian system. A tableland, 10 to 15 m. broad, separates the two main groups, the East or White Mts. and the Franconia (with Lafayette peak). Mt. Washington, the culminating peak, is over 6200 ft. high. There are fine waterfalls, and the wild scenery makes the district a favourite resort. See publications of the Appalachian

Mountain Club.

White Pigments, see Pigments.

White Plains, the cap. of Westchester co., New York, U.S.A., 12 m.
from New York City, on the Bronx R. There are numerous public institu-There are numerous puone insulutions, and fine golf and country clubs. Pop. (1910) 15,949. See Hist. of Westchester co., by Scharf (1886), Shonnard and Spooner (1900).

Snonnard and Spooner (1900).

White River, a river of Arkansas and Missouri, U.S.A., rising in N.W. Arkansas, running N.E. into S. Missouri, where it drains part of the Ozark plateau, and returning to Arkansas flows S.E. and S. to join the Mississippi. Total length about \$800 m. parigsple for steam beats to 800 m., navigable for steam-boats to Batesville.

White Sea, a gulf of the Arctic Ocean, N. Prussia. Its chief bays are Dvina (or Archangel) and Onega in the S., and Kandala in the N.W. Into it flow the rivers Dvina, Onega, Vyg, and Mezen, and its chief port is Archangel. Herring, cod, and other characteristics are found in abundance. The sea fish are found in abundance. The sea is frozen over from September to May.

WhiteStar Line, a line of steamships carrying weekly a transatlantic mail and passenger service between Liver-pool and New York. The line is run by the Oceanic Steam Navigation Company, established in 1869 by Mr. T. H. Ismay. The first of these Whitelocke, Bulstrode (1605-75), an vessels was the Occanic, launched in English lawyer, called to the bar in 1870. In 1883 new services were 1626. He sat for Stafford in parliament (1626) and for Great Marlow in the Long Parliament (1640). Siding with S. Africa and Australia. The with parliament on the outbreak of company's vessels also visit Medi-

terranean ports, Boston, and Yoka- built a church called 'Candida Casa' hama. The gross tonnage in 1910 (397), in which he was buried (432), mana. The gross compage in 1910 (657), in which has ouried (432), was 372,045, and the number of vessels 31. Chief of the important passinger vessels recently built are the Oceanic, Olympic, and Tilanic (9. Whiting (Gadus meriangus), one of Theology, Company vessels recently built are the Oceanic, Olympic, and Tilanic (9. Whiting (Gadus meriangus), one of Theology, Company vessels are the company vessels as the company vessels are the company vessels and the company vessels are the company vessels as the company vessels are the company vessels are the company vessels and the company vessels are the The last-named vessel on her mai voyage collided with an iccberg w. going at high speed and sank in than three hours, with a loss of 1490 extends into lives (April 1912). The ship was the finest of the kind and perfectly equipped. Its length was 882 ft. and breadth 92 ft., its gross tonnage 46.382 tons, and it was built at a cost of £1,175,000. White Sulphur Springs, a popular

watering-place in Greenbrier co., W. Virginia, U.S.A., situated among mountain scenery at an elevation of

1920 ft.

White Vitriol, see ZINC.

Whitewash, slaked lime which has been diluted with water to the consistency of milk. It is used for whitening walls, ceilings, and out-

Whiteway, Sir William Vallance (1828-1908), a Premier of Newfoundland, born near Totnes, Devonshire, He went to Newfoundland in 1843 and was called to the bar in 1852, becoming Q.C. in 1862. From 1865-69 he was Speaker of the House of Assembly, and in 1873 became Solicitor-General in Carter's ad-Carter's Solicitor-General in ministration, succeeding him as Premier in 1878. This post he held until 1885, returning to power 1889-94 and 1895-97. He played a prominent part in the negotiations respecting the Newfoundland fisheries and French shore questions, and went to England four times as a delegate from the colony to the imperial government, but he is chiefly remembered as a promoter of railways in Newfoundland.

Whitford, a par. and vil. of Flint-shire, Wales, 3 m. N.W. of Holywell, has coal-mines, lead and zinc works, and limestone quarries. Pop. (1911)

3219.Whitgift, John (c. 1530-1604), an writerit, sonn (c. 1550-1604), an Archbishop of Canterbury, born at Grimsby. He was fellow of Peter-house (1555), Lady Margaret profes-sor of divinity, Cambridge (1563-67), master of Pembroke Hall and of Trinity College, Cambridge (1567-77), Dean of Lincoln (1571), Bishop of Worcester (1577), and Archbishop of Canterbury (1583-1604). He advocated the theories of Calvin, but supported Anglican ritual. He founded an almshouse and a fine grammar

slender in fc

larger hake, differs from most of the other species of the genus in the absence of a barbel. It makes rapid growth, but rarely exceeds 20 in, in length, and is commonly taken much smaller.

Whiting, see CHALK. Whitley and Monksheaton, an urban dist. of Northumberland, England. 21 m. N. of N. Shields, is a seaside

resort. Pop. (1911) 14,410.
Whitlow, a popular name for inflammatory affections of the finger characterised by painful swelling superficial

volved th attention ment, as t side of its...

pus. If, however, the charge of sheaths of the tendons or the perios-

inflammatory process. Deep Ws. are characterised by a throbbing pain, which is increased when the finger is allowed to hang down. Even if there is no indication of pus, the best treatment is to make a free incision and to dress the wound with antiseptics. Ws. are usually indicative of a low state of health generally.

m. from ude boots. cks.

Pop. (1910) 7292.

Whitman, Walt, originally Walter (1819-92), an American poet, a native of W. Hills, Long Is., was educated in the public schools of Brooklyn and New York. His early career was very varied, and he was apprenticed in turn to a doctor, lawyer, and printer. He then began teaching and contributing to the newspapers, was engaged ascarpenterand builder, and spoke on political questions. In 1846 he became editor of the Brooklyn Eagle and in 1847-48 he made long walking tours up the W. rivers into Canada. He found an outlet for expressing his democratic sentiments by writing verse, which he published in 1855 under the title of Leaves of Grass. The metre he employed was entirely original. He discarded the convenience of the Whithorn (Leukopibia of Ptolemy), a royal bor. of Wigtonshire. Scotland, 12 m. S. of Wigtonshire. Scotland, place of St. Ninian or Ringan, who

of varied length. He was accused of on account of the white robes then indecency and immorality for his worn by the newly baptised. Irankness in speaking of subjects Whittier, John Greenleaf (1807-92), usually tabooed, and the book was banned in Massachusetts in 1881. While serving in the war of 1862-65 W. suffered from malarial fever, which ruined his health for life, and in 1874 he was obliged to resign a government post at Washington on account of his paralysis. He wrote of his experiences on the battlefield in Drum Taps, 1865, and Memoranda during the War, 1867. His other works include Specimen Days and works include Specimen Days and Collects, a prose work, 1883; Demo-Collects, and Society, 1860; and November Boughs, 1888. See his Audobiography, 1892; W. D. O'Connor, The Good Grey Poet, 1866; studies by Bucke, 1883; Binns, 1906; studies by Bucke, William Whittington, was a London william Whittington, was a London William Whittington, was a London Grey Poet, 1866; Songs of Labour, 1850; and National Lyrics, 1865.

Whittington, Richard (d. 1422), 1906; and Basil de Selincourt, 1913.

Whittington, Richard (d. 1422), 1906; and Mayor of London, the son of Sir William Whittington, who held several municipal offices, and was thrice Lord Mayor of London (1397, 1406, and 1419). Around him has been written a legend, but there is probably no basis in fact for it.

Europe (1842-47); made geological Survey of Lake Superior region (1847).

survey of Lake Superior region (1847), reports being issued (1849-51). In-Derbyshire, England, 2 m. N. of vestigated the U.S.A. mining inter-Chesterfield, has collieries, iron-works, ests (1853-54). In 1854 professor at brick-works, and manufactures of Iowa, where he made another extensive any or an earthenware. Pop. (1911) 17.218. tonsire survey; surveyed Missouri, Whittlesey, or Whittlesea, a market 1858-60 (Report, 1862), and Califort n. of Cambridgeshire, on the Nen, nia, 1860-75 (Report, 1864-70). Property in the New More of the

and papers for periodicals.
Whitney, William Dwight (1827-

whitney, William Dwight (1827 de-la-Zouch, has coal-mines and 94), brother of above, an American hosiery manufactures. Pop. (1911) philologist, born at Northampton; 3800.

3800.

Whitwood, an urban dist., W. Whitwood, an urban dist., W. Whitwood, an urban dist., W. W. of Pontefract; manufactures fessor of comparative philology at earthenware, tiles, and bricks. Pop. Yale. Edited many Sanskrit texts, (1911) 5518.

and was recognised as one of the greater Sanskrit scholars. and was recognised as one of the Whitworth, an urban dist., S.E. greatest Sanskrit scholars. Con-Lancashire, England, 3 m. N. of tributed to Böhtlingk and Roth's Rochdale; has coal mines, slate Sanskrit Dictionary. Wrote also quarries, and cotton mills. grammars of German, English, and (1911) 8872.

French, and many works on comWhitworth, Sir Joseph (180) parative philology.

commemorate the descent of the Holy Elswick in 1897. Ghost on the Apostles at that time. Whooper, see Its name is probably an abbreviation

wrote in musical rhythmic sentences; of White Sunday, a name given to it

an American poet, was the son of a New England farmer. He was for a time a shoemaker, but afterwards took up journalism, and amongst other papers edited the American Manufacturer. In 1831 he produced his first volume of poems, Legends of New England, which secured his reputation as a poet, and also won popularity for its abolition sentiment. Further works of his were: Lays of my Home, 1843; Voices of Freedom, 1846; Songs of Labour, 1850; and National Lyrics, 1865.

Whittington Bishod (d. 1422)

bold and Dunstan, an urban dist. of

tershire, England, 5 m. E. of Ashbyde-la-Zouch, has coal-mines and

Whitworth, Sir Joseph (1803-87), a British engineer, born at Stockport. Whitney Mount, a peak of the Sierra After serving his apprenticeship as a Nevada. S. California, named after mechanic, he set up in 1833 as a toolJ. D. Whitney, the famous geologist maker in Manche-ter, and made exIt has an altitude of 14,099 ft. and is periments in rifles, cannons, and the highest peak in the U.S.A. proper, other ordnance. The Whitworth rifle Whittable a waterlander Vert. Whitstable, a watering-place, Kent, was invented in 1857, and was adopted England, at the mouth of the Swale, by the National Rifle Association in 6 m. N.W. of Canterbury, has famous 1860 and by the War Office in 1869, oyster fisheries. Tankerton, a N.E. He founded thirty scholarships in the suburb, is a growing resort. Pop. science and art department for the (1911) 7984. Whitsunday, or Pentecost, a festival His business became a limited liability of the Christian Church celebrated on company in 1874, and amalgamated the seventh Sunday after Easter to with the firm of Armstrong of

Whooper, see SWAN. Whooping-cough, an infectious disease of childhood characterised by Verte and the Matterhorn (1865). He spasms of coughing, consisting of next visited Greenland (1867, 1872), a violent expiration followed by Ecuador and the Andes (1879-80), a strong inspiration causing the and Canada (1901-5). Among his micro-organism

lus has not ye land there is, however, no land there and efforts should be made to disinfect all expectoration in order to prevent the spread of the disease. W. is most common among children under five years of age, and it is to be regarded

as a particularly dangerous disease, not only on account of the high rate of mortality, but because it is apt to leave an enfeebled state of the system, especially of the respiratory The disease is ushered in by catarrhal symptoms which are not to be distinguished from an ordinary cold. In from one to two weeks the paroxysmal cough stage is entered upon. Each paroxysm lasts rather less than a minute; the coughs succeed each other rapidly and alternate with whooping inspirations. The passages are much distended, and the child looks as if it is about to suffo-The paroxysm often ends with vomiting, after which the child appears exhausted but free from pain. The paroxysmal stage may last from three to six weeks, after which there is a stage of decline. The paroxysms are more infrequent, and the symptoms generally are less intense. Pos- co., Kansas, U.S.A., the second city sible complications are pneumonia, in the state. It stands in the centre sible complications are pneumonia, in the state. It stains in the center emphysema, hernia, cerebral hemorrlarge, etc. The treatment consists of careful attention to the general health. Atropine has been found useful in relieving the spasm, though it has no effect on the duration of the disease. In warm weather the child disease. In warm weather the child should be allowed to go out, and during convalescence open air treat-ment in a mild climate is beneficial.

Whortleberry, Bilberry, Blueberry, Whinberry, pr Huckleberry (Paccinium myrti lus), a small shrub with drooping yax-like, flesh-coloured flowers, followed by dark blue berries of an agree ble flavour. The red W., or cowberry (V. vilis-idea), occurs on mountainous heaths and bears red berries. The marsh W., or cranberry (Oxycoccus industris), is a prostrate plant with dark red berries and occurs or the them.

are : Scrambles among the Alps Travels amongst the Great of the Equator, Supplementary Appendix . . and How to use the Ancroid Burometer (1891-92); Chamonix and Mont Blane and The Valley of Zermatt and the Matterhorn (new ed.), 1901. The British and South Kensington Museums contain specimens of his botanical collections from Green-

land and S. America. See Heer in Trans. of Rov. Soc. (1869). Whyte-Melville, George John (1821-78), an English novelist and soldler, born at St. Andrews and served in a Turkish cavalry regiment through the Crimean War. In 1850 he began his literary career by writing sporting novels, chief of which are Digby Grand, 1853; General Bounce, 1855; The Queen's Marys, 1862; Salanella, 1873; and Black but Comely, 1879. He also wrote The Gladiators, Sonys and Verses, and The True Cross. He died from an accident in the huntingfield.

Wiarton, a tn. Bruce co., Ontario, Canada, on Colpoys Bny, 201 m. N.W. of Owen Sound: manufactures lumber, furniture, and cement. Pop. 2500

Wiborg, sec VIBORG.

Wicheta, the co. seat of Sedgwick

nd co. tn. of me N. of Scotmouth of the It has name. (Vac- extensive herring fisheries and a good

harbour. Pop. (1911) 9086.
Wickham, a tn., suburb of Newcastle, New South Wales, Australia, at the mouth of the Hunter R. Pop.

8000.

Wickliffe, see WYCLIFFE. Wicklow: 1. A maritime co., prov. (Oxycoccus industris), is a prostrate plant with dark red berries and occurs on teat bogs.

Whydab, see Whidah.
Whympler, Edward (1840-1911), an English arist, author, and explorer. He travelled among the Central and Western Aos (1860) to obtain sketches of Alpine sciency, and ascended Month Western Aos (1861). His ascent of the Pointe des Brins with a party (1861) was a remarkable mountaineering feat. We also are need the Aiguille Slaney and Avoca, the last named running through the Vale of Avoca and formed by the famous 'Meeting of the Waters' of the rivers Avonmore and Avonbeg; the Liftey and Vartry, the valley of the latter con-taining the reservoirs of the Dublin waterworks. The county is noted for its lovely glens, of which the best its lovery giens, of which the best known are Glendalough, Dargle, Glenmalur, and the Devil's Glen-Granite is quarried in the W., and gold, copper, and lead are found. Agriculture is not very flourishing, sheep and cattle are reared in increasing numbers, and pasturage occupies the greater part of the cultivated land. Oats and potatoes form the main crops. The chief towns are Wicklow (the county town), Bray (7424), and Arklow (4944). The county comprises eight baronies and returns two members to parliament. In the Vale of Glendalough are the ruins of the 'seven churches,' and there are other monastic remains, besides several castles. The area is Pop. 60,824. 2. A 500.216 acres. seaport, market tn., and co. tn. of co. Wicklow, Ireland, 31 m. S.E. of Dublin. Its chief importance is due to the harbour, built to accommodate large vessels, with two fine piers. Trade is carried on in coal, timber, iron, and slate, which form the chief imports, while grain is the principal export. There are large chemical works. There are ruins of a 13th century monastery and part of the parish church dates from the Norman period. Pop. 3288.

Widgeon, Wigeon, or Mareca pene-lope, a duck which visits Britain in winter, usually breeding farther N. It is about 18 in. long. The plumage is grey and brown pencilled with black, the head and neck reddish chestnut, the underparts white. Its flesh is valued for the table. The American W. (M. Americana), is a larger bird and has occasionally

reached Britain.

Widnes, a tn. and municipal bor, of Lancashire on the Mersey, with manufactures of chemicals, soap, and iron.

Pop. (1911) 31,544.

Widow. Legal rights. — On the death of her husband, intestate, the W. is entitled to half his personal property unless there be surriving also a his works appeared in 1818-28 and in child or grandchild, when she takes 1900. See Lives by Gruber (1818), one-third and one-third of his real estate; and she is also entitled to the grant of letters of administration of his whole estate, though the child or grandchild, when she takes one-third and one-third of his real his whole estate, though the court may in its discretion make the grant to the next-of-kin instead or to both the W. and the next-of-kin jointly. W.-bench by a Sussex custom meant

Harbour is the only inlet of import-the share a W. was entitled to of her The principal rivers are the husband's estate, over and above her The term widow's chamber iointure. jointure. The term widow's chamber denoted the apparel and furniture of the bed-chamber of the W. of a freeman of London, to which she was once entitled. See also TERCE, JUS RELICIE, DOWER, and SATI.

Wied, William Frederick Henry, Prince of (b. 1876), born at Neuwied, second son of the fifth prince of Wied, by his marriage with Marie, Princess of the Notherlands nerolesy of Queen

of the Netherlands, nephew of Queen Elizabeth of Roumania ('Carmen Sylva'), great-grand-nephew of Emperor William I. of Prussia, chosen by the powers in Nov. 1913 to be first sovereign ruler of Albania. Entered the Guards Regiment in Berlin and later appointed captain in the great general staff. Until five years ago it was arranged that in the event of Queen Wilhelmina of Holland dying general staff. without issue he should be King of the Netherlands. In 1898 he mar-ried Princess Pauline of Würtemberg, by whom he has two sons.

Wieland, Christoph Martin (1733-1813), a German author, the friend of Goethe, Schiller, and Herder, was born near Biberach in Würtemberg, the son of a Swabian pastor. While the son of a Swapian passon. The still at the University of Tübingen, he published a didactic poem Die Natur der Dinge (1751), which was followed by works of like seriousness, such as

ritten under the Meanwhile, he accepted various tutorships until, in 1760, he was appointed director of the Chancery of Biberach. He then published a translation of Shakespeare, the first issued in German (1762-66), and wrote some delightful prose romances: Araspes und Panthea (1761), Don Sylvis von Rosalva (1764), and Agathon (1766). His most important contributions to German poetry are Musaria (1768), Idris (1768), Der Neue Amadis (1771), and Oberon (1780). He was appointed professor of philosophy and literature at Erfurt (1769-72) and then became tutor to Prince Charles Augustus at Weimar. His famous prose romance, Der Goldene Spiegel, appeared in 1772, and its sequel, Der Danishmend, in 1775. W. also wrote operas and edited Der Teutsche Merkur (1773). Complete editions of

markable for its celebrated salt mine. which extends under the whole town and to a considerable distance beyond it on each side. Pop. 7150.

Wiener-Neustadt. tn.. Lower Austria, 31 m. by rail S. of Vienna; has manufs. of ammunition, engines, textiles, pottery, and leather. The old castle (12th century) was converted into a military college (1752). Some of the most notable types of Ws.

Alps, includes the peaks of 'Hoher Lindkogel' (2780 ft.), near Baden, Hohenstein (2120 ft.), Kahlenborg (1400 ft.), and Leopoldsberg (1380 ft.), all near Vienna.

Wiesbaden, the cap. of the duchy of Hesse-Nassau on the N. slopes of the Taunus range, has sulphurous springs which have made it a world-

famous watering-place. Pop. 109,000.
Wiesen, a health resort for pulmonary complaints, Grisons canton, Switzerland, at an alt. of 4771 ft., 12½ m. S.W. of Davos.

Wife, see HUSBAND AND WIFE;

Wife, see Husband and Wife, Marriage and Marriage Law.
Wiffen, Benjamin Burron (1794-1867), an English biographer, of Quaker parentage, brother of Jeremiah Holmes W. (librarian at Woburn Abbey and translator of Tasso). He visited Spain with G. W. Alexander (1839, 1842), and was a friend of Luis de Usoz y Rio, with whom he worked to make known the writings of early Spanish reformers. W. helped to produce Obras Antiquas de los Españoles

Wig, the use of Ws. is probably so old that no historian can assign any precise date of origin, though it may be otherwise with regard to particular styles of Ws. The Emperor Otho is said to have worn a W. which was so well made that it could not be distinguished from natural hair, and there is evidence in Ovid that the Roman ladies were blond wigs to enhance their charms. In France they appear to have been worn even before the middle ages, though according to Mézeray they were not introduced until the reign of Louis XIII. They were probably not common in England before the Tudor period, but thereafter became the height of of thereafter became the height of fashion. It was only during the lattashion. ter half of the 18th century that Ws. passed out of general use except in the professional classes. Physicians, says Lecky, discarded their great Ws.

The Cree and the Bladenoch are both
and assumed what Boswell called
the 'levity of bag wigs.' The same
historian tells us that in 1765 the
perruque makers had become so deperruque makers had become so de pressed in their calling that they pre-sented a petition to the King com-plaining bitterly of the growing cus-townshire. The inhabitants are

were the Blenheim, so named after the Wienerwald, a mountain range of Lower Austria, a branch of the Noric Alps, includes the peaks of 'Hoher Lindkogel' (2780 ft.), near Baden, worn by judges on ceremonal occasions.

Wigan, a market tn., parl, and municipal bor, of Lancashire, England, 40 m. S.E. of Lancaster on the R. Douglas. It is an ancient place, divided by the river into two parts. Its chief industry is the manufacture of cotton, but it also makes chemiof cotton, but it also makes enemi-cals, soap, iron and brass goods. Pop. (1911) 89,152.

Wight, liste of, an island off the coast of Hampshire, in which county it is included, in the English Channel,

separated from the mainland by the Solent and Spithead. Area 147 sq. m.; greatest length 231 m.; greatest breadth 13 m. It has chalk cliffs and downs, the highest elevation being St. Boniface Down (787 ft.). Off the W. coast are the rocks known as the 'Needles.' The scenery of the I. of W. is very picturesque, with its narrow ravines or chines and rivulets. The climate, too, is pleasant and healthy, and the sea-bathing excellent, so that the Isle is a great The Newport n, Vent-Pop.

(1911. on's The Isle of Wight, 1911. Wigston Magna, a par, and vil., Lejeestershire, England; has frame-work knitting industries and railway workshops. Pop. (1911) 8652

Wigton, a par. and market ta., Cumberland, England, 111 m. S.W.

of Carlisle; manufs. Jam and cloth. Pop. (1911) 3687. Wigtown, a peninsular co. in the S.W. corner of Scotland, is divided into three districts—the Machan, or into three districts—the Machar, or low country, lying between Wittown and Luce Bay; the Rhynns, which comprehends the portion to the W. of a line drawn between Luce Bay and Loch Ryan; and the Moors, which includes the remainder. climate is salubrious, although the rainfall is considerable. Nowhere does the land rise to a great elevation and there are no considerable rivers. The Cree and the Bladenoch are both

Wigtown, a market th. royal and

mainly engaged in fishing.

Wigwam, the hut or cabin of N. American Indians, which consists of a rough conical framework of poles stuck into the ground below and conreging above, covered with bark, matting, or tanned hides, with an aperture at the top for the exit of smoke. W. is the English corruption of wekou-om-ut, 'in his house.' Wi-ju, a walled tn. in Phyöng-an prov., N.W. Korea, near the Yalu estuary; opened to foreign trade in 1911. Pop. 30 000.

1911. Pop. 30,000. Wilberforce, Samuel (1805-73), bishop of Winchester. He upheld the traditions of the Anglican orthodoxy during the days of the Tracta-rian movement and the secession to Rome of men like Newman and Manning. He published Eucharistica, 1839; Agathos, 1840; and The History of the Protestant Episcopal Church in

America, 1844.
Wilherforce, William (1759-1833), a philanthropist, entered parliament when he attained his majority, and soon became on intimate terms with the leading statesmen of the day, with most of whom he corresponded. He was to the fore in many philanthropic movements, but the great work of his life was in connection with the abolition of slavery, of which cause he assumed the leadership in 1787. It was not until twenty years later that his dream was realised, and a Bill received the royal assent. He was asso-ciated with societies for the supciated with societies for the sup-pression of vice, the Bible Society, and many missions. There is a Bioby his sons, Robert and graphy Samuel (1838).

Wild, Jonathan (c. 1682-1725), a English thief, born at buried in Kensal Green cemetery notorious Wolverhampton, who organised a

Wildbad, a watering place, Würtem- dalen

Pop., the Act of 1880 contains a list of wild birds specially protected, and as to these it is an offence in any one to disregard the close season. But an disregard the close season. But an owner or occupier of land (or a person authorised by an owner or occupier) commits no offence by shooting wild birds on his land which are not included in the Schedule. A Secretary of State is empowered under the Acts, on the application of a county council, to make an order prohibiting the taking or destruction of eggs of wild birds within local limits and periods specified by the order. There is also an important provision against setting up on poles, trees, or cairns any spring or trap calculated to injure wild birds. It is to be observed that the list of protected birds and the vary in seasons different counties, with the result that it is impossible without looking into existing local orders to say precisely what the law is as to the killing of any particular bird in any particular locality. A list of the various orders up to March 15, 1912, will be found in

Oke's Game Laws. Wild Boar, see BOAR.

Wilde, Jane Francisca (née Elgee), Lady (1826-96), an Irish writer, wife of the Irish surgeon, Sir William (1815-76), and mother of Oscar (1856-1900). She wrote Poems (1864) under the pseudonym of 'Speranza,' her other works including: Notes on Men, Women, and Books, 1891; Driftwood from Scandinavia, 1884; Legends of Ireland, 1887; Social Studies, 1893, and other pamphlets, and contribu-tions to The Nation, 1845-48. Her 'salon' in Dublin was much fre-quented, but after her husband's death she settled in London, and was

Wilde, Oscar O'Flahertie Wills (1856-Wolverhampton, who organised a Wilde, Uscar Ullianertie Wills 11800-band of thieves and opened offices in 1900), a dramatist and essayist, was London for the restoration of the the younger son of Sir William W., property which his own employees the Dublin surgeon, by his wife, née had stolen. He was arrested and lange Francisca Elgee, who attained langed at Tyburn. His fame lives in notoriety in literary and political Fielding's novel, The Late Mr. circles for her writings over the signa-Jonathan Wild the Great, 1743.

Wildland a weeting place Wiltern, deeper College Oxford. W. there College, Oxford, W. berg, Germany, in the Enz ravine of founded an esthetic cult, for advocaberg, Germany, in the Enz ravine of the Enz ravine of the Black Forest, 14 m. E. of Baden-Baden; has thermal alkaline springs and baths. Pop. 4000.

Wild Birds Protection Acts. These Acts (passed in 1880, 1881, 1894, 1896, 1902, 1904, and 1908) provide a close time, namely between March 1 and lectured on esthetic philosophy. He had already, in a close time, namely between March 1 which, in spite of affectations, attempting to shoot any wild bird, together with penalties for non-observance of such close time. It is observance of such close time. It is years later when he issued The Happy an offence to expose for sale any wild Prince and Other Tales, the fairy story bird taken in the close season, pro- that gave its name to the volume vided it be exposed for sale recently being exquisite. Lord Arthur Savile's after being so taken. The Schedule to . Crime, and other Stories, and his only

novel, The Picture of Dorian Gray, both appeared in 1891. It is probably as a dramatist that W. will ultimately be remembered, and, with Pop. 8300. the exception of Salome (1893), his successes were made in the realm of light comedy, where he could give full play to his fantastic wit. Lady Windermere's Fan (1892), A Woman of no Importance (1893), and The Ideal Husband (1895) were each and all successful, but his masterpiece was that moral comedy for serious people,' The Importance of being Earnest (1895), which places him in the same rank with Goldsmith and Sheridan. His last works were The Ballad of Beading Jail, 1898, and De Profundis (posthumous, 1905). See Life by Sherrard.

Wildebeest, see GNU. Wildenbruch, Ernst Adam von (1847-1909), a German poet, dramatist, and novelist, born at Beirut, in Syria. served in the Prussian army through the campaigns of 1866 and 1870-71, was appointed judge at Frankfort, and having entered the state service 1877, became privy councillor of legation (1897). His chief plays, reflec-

poet is found in Sedan, 1875; Lieder und Gesange, 1877; and Dichtungen und Balladen, 1884.

Wilderness, a desolate region S. of the Rapidan R., in Virginia, U.S.A., 15 m. W. of Fredericksburg, where a battle of the Civil War was fought under the command of the rival

generals, Grant and Lee. Wilfrid, St. (634-709), a bishop of York, was a Northumbrian by birth, and was educated in the monastery at Lindisfarne. W. supported the Roman party in the Synod of Whitby in 664, and was consecrated bishon in the same year. He appealed to Rome against Ægfrid of Northumbria, and on his return to England (681) was shipwrecked off Frisia, where he

made many converts.

Wilhelmshaven, a military port and seaside-resort of Hanover prov., Prussia, on the N.W. shore of the Jade Busen, 18 m. from Bremerhaven. is the station for the German North Sea fleet, and has a fine harbour for war-vessels and slips for trading veswas acquired The territory sels. from Oldenburg (1853). extensive docks, moles, foundries, naval stores and workshops, boilerworks, a signalling station, and a meteorological observatory. Pop. meteorological observation, Pierabout 26,010. See von Krohn, Pieraj Jahre in einem Deutschen Kriegshafen, 1905; Eberhard, Führer Durch Wilhelmshaven, 1906.

Wilhelmshöhe, see Kassel. Wilkau, a vil. of Saxony, Prussia,

S.E. of Zwickau, has iron-foundries.

Wilkes, Charles (1801-77), a naval officer, born in New York. Entered the navy 1816, appointed to the Depôt of Charts and Instruments, Washington, 1830. Commanded an exploring expedition from 1838-42: surveyed the Samoan group, discovered many islands, and the Antarctic continent. In 1861 he commanded the steamer San Jacinto. and forcibly removed from the British mail-steamer Trent Messrs. Mason and Slidell, commissioners of the confederatestates to England and France. He commanded a squadron in W.

Indies, and was made rear-admiral. 1866. He wrote Narrative of U.S. Exploring Expedition: Western America; Theory of the Winds, etc.
Wilkes, John (1727-97), a politician, was in early life a dissolute man, and was one of the fraternity of Med-menham monks. He entered parlinment in 1757, and was later active in opposition to Bute. He founded in 1762 The North Briton, to which ting the patriotism of young Prussia, Charles Churchill was a valuable contributor, and in the following year was arrested for a libel uttered in the famous No. 45. He was found guilty but pleaded privilege as a member of parliament. parliament. He was expelled from Westminster in 1764, and went abroad for four years. After his return he was elected member for Middlesex, but was expelled in 1769 for another He was thrice returned for libel. Middlesex, but was not allowed to take his seat until 1790. In 1774 he had been elected Lord Mayor of London, and from 1779 until his death was city chamberiain. His correspondence was published by John Almon in 1805. There are blo-graphies by Fraser Rae and Percy Fitzgerald.

Wilkes-Barre, a co. seat of Luzerno co., Pennsylvania, on the Susque-hanna R., in an anthracite coal mining district.

r district. Pop. (1910) 67,105. Wilkie, Sir David (1785-1841). Scottish painter, born at Cults, in Fife, he studied art in Edinburgh and then went to London, where his pictures soon began to attract notice. In 1811 he was made R.A., and in 1825 he travelled in Spain, while shortly after his return to England he was appointed painter to the crown, and in 1836 he was knighted. Four years later he visited Turkey and Palestine, and, dying on board ship while on his way home, he was buried at sea near Gibraltar.

Wilkins, Sir Charles (c. 1749-1836). an English Orientalist, served the E. India Co. in Bengal (1770), learning

Sanskrit, Persian, Arabic, and other tongues. He established a printingin 1869.

press for Oriental languages (1778), and with Jones founded the Bengal active neutral operations, all our 'Asiatic Society' (1784). His translations from the Sanskrit include: attending to things, together with Bhagarad-gila, 1785: Hitopadésa, 1787; and the Story of Salvurtala (from the Hully form). 1793 of the three sides of Wind—Feeling. the Hindoo epic Mahabharata), 1793 and 1795. He re-edited Richardson's Persian, Arabic, and English Dictionary, 1806, and published a Sanskr' Company of the Company of anc. Sec '

Wilkins, John (1614-72), an English scientist and divine, Bishop of Chester from 1668. He was made warden of Wadham College, Oxford (1648), sided with parliament during the Civil War, and married Cromwell's sister, Robina (1656). W. helped to found the Royal Society (incorporated 1662) and was its first secretary. His works include: Discovery of a New World, 1638; 3rd ed. 1640; Discourse Concerning a New Planet, 1640; Mathematical Magic, 1648; Essay towards a Real Character and a Philosophical Heat Character and a Philosophical Language (his chief work), 1608. See Burnet, Hist. of his Own Times; Diaries of Evelyn and Pepys; Life by Angiers, Willughby; Whewell, Ind. Sc., i.; Wright Henderson, Life and Times of J. Wilkins, 1910.

Wilkins, PALTOCK, Peter. εee ROBERT.

Wilkins, William (1778-1839), a British architect, born at Norwich. He became architect to the E. India Company and professor of architecture at the Royal Academy (1837). His principal buildings include University College, London, the National Art Gallery, and Halleybury Col-

lege.
Wilkinsburg, a bor., Allegheny co.,
Pennsylvania, U.S.A.; is practically an eastern suburb of Pittsburg. Pop.

(1910) 18,921.

Wilkinson, James (1757-1825), an American soldier, born in Benedict, Maryland. He entered the American service in 1775, fought outside Boston and at La Chine, serving in turn under Arnold and Gates, and was clothier-general of the Continental army (1779-81). He was twice court-martialled (1807, 1814), but though acquitted at the time facts have since proved him to be a traitor.

of the three sides of Mind-Feeling, onurata), 1133 of the three sides of Mind—Feeling, and Willing, and for their English Dicplished a Sanis referred to Emorrows. By simply moting that the first actions are bodily, simple, and external, and are merely responses to sense-impressions. while the later ones are complex, internal, and representative, e.g., choosing, it can be seen that the laws governing the growth of will are the same as those which govern intellectual development, and these are outlined in Emotions (q.r.), these being exercise, retentiveness, and association. W. is usually divided into external and internal, the former including muscular action and the latter mental action and voluntary atten-Yet although tion or concentration. these are separate branches, they are interdependent, for attention volves muscular activity and voluntary movement attention; while in complex processes, e.g., choosing, attention plays a great part. Early movements may be divided into random movements, which result from the excitation of motor centres, and are not preceded by any conscious and reflex element, movements. which result from sensory stimula-tion. Examples of the first class are the movements of the legs and arms of babies; of the second, the closing of the fingers of an infant on an object placed in its hand. Neither of these show any psychical accompaniment, but instinctive movements, e.g.. the sucking of an infant, while closely analogous to reflex movements, seem to possess some element of desire or striving to an end. Bain has shown that random movements are the commencement of the development of roluntary movement, while Spencer and others take reflex movements as the initial stage. The individual differences of W. depend chiefly upon keenness of desire, and beyond this upon the power of the disposition to the cost Cost control involve W. Self-control implies W., and by many this is considered to be differ-Wilkinson, James John Garth (1812- ent from the earliest forms, for it in-99), an English Swedenborgian and volves a force which can overcome miscellaneous writer, born in London. Ile practised in London as a homeopathist, and wrote on medicine, ture of free-will, or deliberative choice. philosophy, and law. His chief works are: Emanual Steedenborg, 1849; Im- form of the activity of the W. Popu-provisations from the Spirit, 1857; larly free-W. means a W. unfet-Human Science, 1876; and Epidemic tered by imposed restraint or com-Man and his Visitations, 1842. He pulsion in any form.' Philosophy

has built upon this the idea that in greater part of his life there, sharing choice-accompanied action the result lodgings for a while with Diderot, may be undetermined, and not always Among his engravings is a famous one determined by desire or aversion. After Louis le Tocque's perirait of That is, the W. is self-determining. determined by desire or aversion. That is, the W. is self-determining, and may lead action away from the strongest desire. This may be said to be a metaphysical doctrine, since it implies a theory respecting the nature of the mind and the ego in it-self as an active principle, so leading Dilke, French Engravers of the Eigh-to questions concerning power and teenth Century, 1902. nature of the mind and the ego in itcausality (q.v.). See DETERMINISM, KANT, LOTZE, HERBART, DES-HERBART, CARTES, SCHOPENHAUER, SIDEWICK, CALVIN, HUME, HOBBES, and BAIN. Read Sully, Handbook of Psychology;

The Human Mind (2 vols.). Willamette, a riv. of Oregon, U.S.A., formed by the union of the Coast Fork and Middle Fork. It has a northern course and enters the Columbia R. in Columbia co. in the north-western part of the state. It has a length of 200 m., and is navigable for large steamers to Portland.

Willan, Robert (1757-1812), English physician; educated at Sedbergh Grammar School and at Edin-burgh. He took his medical degree in 1780, and became physician at the Public Dispensary of Carey Street, London, in 1783. W. made a careful classification of diseases of the skin, for which he received the Fotherrolling gold medal (1790). His Description and Treatment of Cutaneous Diseases (1798-1808) was completed by Dr. Ashby Smith (1814). See Munk's Coll. of Phys.: Bateman's Membris Edicinal 37.3 and 60. Memoir in Edinburgh Med. and Surg. Journ., xxxii.

Willard, Frances Elizabeth (1839-98), an American writer and educa-Evanston, where she became professor and finally dean. She was also president of the Woman's Christian

See Life by

Witts, 1898. Willdenow, Karl Ludwig (1765-1812), a German naturalist, studied medicine at Halle, becoming professor of natural history at Berlin (1798). and director of the Botanical Garden (1806). He published a new edition of Linnæus' Species Plantarum (1798-

he also perpetuated various works by Gerard Dou and Terborch, and he wrote a volume of Mémoires (Paris. 1857) which constitutes an historical

Willoms, Florent (1823-1905), a Belgian artist, born at Liege. He studied at the Mechlin Academy and in 1844 settled in Paris. He was inspired by the work of old Dutch masters, and drew his subjects chiefly from indoor domestic life.

Willemstad, a tn. and cap. cf Cura-coa, Dutch W. Indies, on St. Ann's Bay, on the S. coast, has a trade in sugar, tobacco, and lime phosphates. Pop. 9000.

Willenhall, an urban district and tn. of Staffordshire, England, 3 m. E. of Wolverhampton, has coal-mines, iron and brass foundries, manufactures of locks, bolts, and bicycle cast-

Pop. (1911) 18.858. Willesden, an urban dist. of Harrow div., Middlesex, England, 7 m. from St. Paul's, London, 1 m. from W. Junction. W. Green, Cricklew. Junction. W. Green, Crickle-wood, and Neasden (N.) are adjoining districts. Kilburn and Brondesbury lie to the E., and Harlesden to the S. St. Mary's Church has Norman re-mains. Pop. (1911) 151,214. William I., surnamed The Con-queror (1027-87), King of England. was a natural son of Robert H. Duke

was a natural son of Robert II., Duke of Normandy, but in spite of the barsinister, succeeded to his father's New York, and educated at the his position, though he had to light North-Western Women's College at to do so. In 1064 Harold, then Earl to do so. In 1064 Harold, then Earl of Wessex, and afterwards king of the English, was shipwrecked off Pon-thieu and captured by William, who only released him on his promising to support W.'s claim to succeed to the English throne on the death of Edward the Confessor, who had under-taken to nominate him as his succes-On the death of Edward in 1066 Harold broke his word and ascended the throne. W. without delay in-vaded England. Relanded at Pevensey, near Hastings, on September 28, and on the following October 14 met and defeated the home army at a place since called Battle, in which encounter Harold was killed. bunnauem (Line to., 1011), commission of Butterflies in Brandenburg Mark.
See Schlachtendahl, Leben; Edinburgh Review (July and Oct., 1807).
Wille, Johann Georg (1715-1808), an engraver: a Hessian by birth, he went while a boy to Paris, and spent the

the Conqueror, and succeeded to the appointed Lord High Admiral in 1827 throne on the death of his father in 1087. His eldest brother, Robert, was Duke of Normandy, and in 1091. He was a man of homely talents, W. invaded the duchy, but being spanted certain rights, co-operated with Robert against his French neighbours. W. was cruel and grasping, and hated by his subjects, who certainly did not mourn his death, which resulted from his hologophat by Walter Tile Forest. He fought in the war against France He fought in the war against France William V., last stadtholder of the Cupture of the Header. He fought in the war against France He fought in the war against France

against France, and as commander, though not always successful, he showed an indomitable spirit. Perhaps the most far-reaching event of his life was his marriage in 1677 to Mary, daughter of James, Duke of York, afterwards James II., King of England. When the English folk were estranged from James II., overtures were made to W. to invade England. These he accepted, and landed with a small force near Torquay on Nov. 5, 1688. On the flight of James II., the throne was offered to Mary, but William declared that unless he was made joint-monarch with his wife, he would withdraw to Holland. He was crowned with Mary in April 1689. In the following year he defeated was James II. at the battle of the Boyne, and having conquered Ireland prodeath he gave the royal assent to the Act of Settlement, which secured the throne ultimately to the House of

his absence. He met with his 1789. Shortly after this dignity was death as the result of an accident conferred upon him, he contracted an when riding. W. the Conqueror was a brave man, a capable soldier, and an able administrator. It was during for twenty years, and by whom he his reign and at his instance that the survey was made, the results of which were entered in the Domesday Book.

William II commonly known as alledest, daughter of George, Duke of William II., commonly known as eldest daughter of George, Duke of William Rufus (1056-1100), King of England, was the third son of William was no issue of this alliance. He was the Conqueror, and succeeded to the appointed Lord High Admiral in 1827 throse on the death of his father is

Tile King of (1793-95), and on the defeat of England, Scotland, and Ireland, was Holland served in the Prussian and the posthumous son of William II., Prince of Orange and Mary, daughter of Charles I. and Princes Royal of interest of Vienna Belgium was of Charles I. and Princes Royal of interest of the captain-general of the Dutch forces, and, not long after, stadtholder. He was in the main responsible for the direction of the war of Count of Nassau, and died in against France (1793-95), and on the war against France (1793-95), and on the defeat of England, such as a such against France (1793-95), and on the war against France (1793-95), and on the war against France (1793-95), and on the defeat of England, such as a such against France (1793-95), and on the defeat of England, such as a such against France (1793-95), and on the defeat of England, such as a such against France (1793-95), and on the defeat of England, such as a such against France (1793-95), and on the war against France (1793-95), and on the defeat of England, such against France (1793-95), and on the defeat of England, such against France (1793-95), and on the war against France (1793-95), and on the defeat of England, such against France (1793-95), and on the war against France (1793-95), and on the Wingham (1813-181).

Berlin.

William I. (1797-1888), King of Prussia and Emperor of Germany. He was responsible for the absolutist and autocratic ideas which have pervaded the rule of the present im-perial house of Germany. He found in Bismarck a minister anxious to govern according to his own view, and it may be said that between them they had a large part in the making of modern Germany. During the Fran-co-Prussian War W. commanded the Prussian army and led his soldiers to the victories of Gravelotte and Sedan. He was proclaimed Emperor of Germany in the Palace of Versailles on Jan. 18, 1871.

William II. (Friedrich Wilhelm Victor Albert) (b. 1859). German Emperor and King of Prussia, born at ceeded to subdue Scotland. He went Berlin. He is the elects son of the to Holland in 1793 and commanded Crown Prince Frederick (afterwards the Dutch army. He died from the Frederick III.) and of Victoria, Princeffects of an accident while riding at cess Royal of Great Britain, and the Hampton Court. Shortly before his grandson of William I. He received a sound military training, and in 1885 had risen to the rank of colonel in the Hussars of the Guard. On the death Hanover.

of his father in 1888, he succeeded to
William IV. (1735-1837), King of the throne, and before long, by his inGreat Britain and Ireland, was the domitable will and determined autothird son of George III. and Charlotte cracy, had a very powerful influence
Sophia, Princess of Mecklenburg- in Germany. Two years after his
Strelltz. He went to sea in 1780, and accession Bismarck, finding his own in five years was promoted captain, influence ebbing away, was obliged He was created Duke of Clarence in to resign. The Kaiser's chief ambition

on the increase of armaments. This the E. in the middle ages, aggressive policy has been watched with many misgivings by other European powers, and particularly by England and France. W. has played a very prominent part in European politics, but has frequently caused offence both to his own subjects and offence both to his own subjects and at Flemingston, Glamorgan. Under to foreign nations by his unguarded the bardic name of Iolo, he collected utterances in public. He is a man the Welsh MSS. published as Myryof great versatility and exuberant energy, and is a keen sportsman, a poet, a painter, and a wide reader. In 1881 he married Princess Victoria of Solles matried Frincess Victoria of Schleswig-Holstein, and has had six sons and a daughter. See The German Emperor's Speeches (trans. by L. Elkind), 1904, and Noussanne's William II., 1905.

William IX. (1071-1127), Duke of Aquitaine and Count of Poitou, and an early Provencal poet; succeeded the bind-picture of the second of the secon

to his hereditary estates in 1087. He went on a crusade in 1100 and reached Jerusalem, but was shipwrecked on his journey home. He was wild and gay and fond of warfare. Besides assisting the King of Aragon against the Moors and Louis the Fat against the Germans, he made inroads upon Toulouse and plundered Normandy. His songs are valuable to the student, being the earliest extent poems of the Romance school. See Mahn's Die

Romance school. See Mahn's Die Werke der Troubadours, vol. i., 1846. William and Mary College, Wil-liamsbury, Virginia, U.S.A., an insti-tute of higher learning, founded in 1693. It is a state institution, and in 1913 had 241 students with 20 in-structors. The Phi Beta Kappa

was founded here in 1776.

William of Champeaux (c. 1070-1121), a French philosopher, the the founder of scholastic realism. set up a school of logic in Paris, which was attended by Abelard (q.v.), his future rival. In 1113 he became Bishop of Chalons-sur-Marne.

William of Jumièges, see Jumpeges. William of Malmesbury, see Mal-MESBURY, WILLIAM.

William of Newburgh (1136-c. 1198), william of Newburgh (1130-c. 1198), an Early English historian, who wrote a Historia Rerum Anglicarum towards the end of the 12th century. His history begins in the year of the Conquest and extends to his own time. See edition of the Rolls Series the Charterhouse and extends to his own time. See edition of the Rolls Series the Charterhouse and Pembroke (1884). William was a monk of the Augustinian priory at Newburg. towards the end of the 12th century. Conquest and extends to his own time. See edition of the Rolls Series Yorkshire.

William of Orange, see WII I. OF ENGLAND; WILLIAM see Will "" III. of

ded the city of

William of Tyre (c. 1137-84), arch- Providence where all true democrats

has been to strengthen Germany's bishop of Tyre and author of the power in Europe by colonial expansion abroad. To this end he has reorganised the Germanarmy and navy, and has advocated a vast expenditure. He was one of the principal ecclesiasand has advocated a vast expenditure. Which the life the residule page.

William of Wykeham, see WYKE-

HAM, WILLIAM OF.
Williams, Edward (1746-1826), a
Welsh bard, born at Penon, Glamorganshire, the son of a stonemason. He settled as a land surveyor rian Archwology, 1801, and Iolo MSS., 1848.

Williams, Sir George (1821-1905), the founder of the Young Men's Christian Association, born at Dulverton, Somersetshire. He went to London in 1841 and went into a drapery business, and becoming very successful was a personal factor of great good in an influencial sphere during the Victorian era. He started the Young Men's Christian Association in 1841. and it was owing to him that Exeter Hall was secured for its headquarters. He was also interested in the Band

of Hope Union.
Williams, Hugh William (1773-1829), a Scottish painter and writer. He lived chiefly at Edinburgh, but spent several years travelling in Europe, and in 1820 he published Travels in Italy, Greece, and the Ionian Islands, illustrated with engravings after his own sketches. Many of his best pictures are in the National Gallery of Scotland, while some others are in the Glasgow Municipal Museum.

Municipal Museum.

Williams, Sir Monier Monler (1819-99), a Sanskrit scholar, born at Bombay. He laboured with distinction in bringing westward the wisdom of the Orient, and wrote Religious Life and Thought in India, 1883: Indian Epic Poetry, 1873: Indian Wisdom, 1875: and Sanskrit Dic-tionary, 1851-72. He also translated the Sakuntala and published works Buddhism, Brahmanism, and Hinduism. Among other posts he held that of Boden professor of Sanskrit at Oxford in 1860, and was fellow of Balliol, 1882-88.

in search of re-

He preached at Plymouth (1635).

might live. Here, too, he established ing in a pleasant country. the Baptist Church. He was president of Rhode Is. from 1654-57, and published many works, including The Bloudy Tenent (1644), and The Hireling Ministry none of Christ's (1652).

See Club's edition of his works (6 vols., 1652). 1866-74), and Lives by Knowles (1833) and Elton (1852).

Williams, Rowland (1817-70), an Anglican divine and author of Christianity and Hinduism (1856). was a Hebrew scholar of considerable distinction, and had an acquaintance with several oriental languages. professor, he was connected with St. David's College in Wales and also with the University of Cambridge. He published beside the work men-

tioned Lampeter Theology (1856), and some noems and hymns.

Williams, Samuel Wells (1812-84), American philologist, born at Utica, New York. He went to Can-Utica, New York. He went to Canton, China, as printer to the American Mission in 1833, and acted as interpreter to Commodore Perry on his Japanese mission (1853-54). He was secretary of the United States legation at Peking (1862-76) when he returned to the U.S.A. and accepted the chair of Chinese at Yale. He was secretary of the chair of the regarded as an authority on the Chinese and Japanese languages, and published, amongst other works: A Syllabic Dictionary of the Chinese

A Syllabic Dictionary of the Chinese Language, The Middle Kingdom, The Topography of China.

Williamsburg, the co. seat of James City Co., Virginia, 48 m. S.E. of Richmond; it contains the William and Mary College (1693), and East State Lunatic Asylum (1769), and wanted business and woollen goods. manufs, lumber and woollen goods.

Pop. (1910) 2714.

Williams College, Williamstown, Massachusetts, U.S.A., was founded in 1793 from a free school which owed its origin to Col. Ephraim Williams. It is well endowed and has a large number of scholarships. The library is good, and there are 22 college buildings. In 1913 the college had 558 students and 59 teachers.

Williamson, Peter (1730 - 99), a Scottish publisher and writer, born at Aboyne, Aberdeenshire. He had a most adventurous boyhood. At the age of about ten he was kidnapped and telepath a second bound to be a second bound and taken to America; he was sold to planters, captured by Indians, but managed to get away, and enlisted as a British soldier. On his return to Scotland, he started in business as a publisher and founded two journals called the Scots Spy (1776) and New Scots Spy (1777) and issued the first Edinburgh Director in 1772

manufactures of lumber, iron-goods, textiles, etc. Pop. (1910) 31,860.

William the Lion (1143-1214), succeeded his brother as King of Scotland in 1165. He was the grandson of David I. Henry II. of England refused to return Northumberland to Scotland, and so William made an alliance with France against England in 1168. In 1174 W. invaded England in alliance with Henry's own sons, was defeated at Alnwick, and sent as a prisoner to Falaise in Nor-mandy. By the treaty of Falaise he was liberated, but he agreed to do homage to Henry for Scotland and all his other territories. He returned to Scotland in 1176, founded a monastery at Arbroath, 1178, and made the Church of Scotland independent

of that of England. By the Treaty of Canterbury between him and Richard I. the independence of Scotland was recognised on payment of 10,000 marks. William the Silent, Prince of Orange (1533-84), the founder of the Dutch republic, the eldest son of William, Count of Nassau, was born at Dillenburg in Nassau. In 1544 he succeeded a cousin to the principality of Orange and estates in Flanders and Holland, and before he was twenty-one Charles V. appointed him general-in-chief of the army and stadtholder of Holland, Utrecht, and Zeeland. In 1559 Henry II. of France, thinking him to be in the confidence of Philip II., told him of the Spanish plot to crush out Protestantism in the Netherlands. He did not betray his ignorance and his anger by word or look, and was henceforth known as the Silent.' In 1567 he placed himself at the head of the national rising against Spanish persecution, and openly embraced Protestantism. He was at first defeated by Alva, largely through want of means, but in 1579 he established the union of the seven northern provinces. He was assas-sinated by Balthazar Gerard, an agent of Philip II. See Motley's Rise of the Dutch Republic; Cambridge Modern History, vol. iii.; an! Lives by F. Harrison (1897) and Ruth Putnam (1911).

Willibrord (or Willebrod), Saint (c. 657-738), an apostle of the Frisians, born in Northumbria, and brought up in a monastery at Ripon. thanaged to get away, and enlisted as a British soldier. On his return to a Scotland, he started in business as a publisher and founded two journals called the Scots Spy (1776) and New Scots Spy (1777) and issued the first Edinburgh Directory in 1773.

Williamsport, the co. seat of Lycoming co., Pennsylvania, U.S.A., is a well-built and imposing town, stand-

stone-quarries. Pop. (1911) \$734.
Willington Quay, a tn. and par.,
Northumberland, England, on the
Tyne, 2 m. S.W. of North Shields,

ford St. Mary. He was member for 1885. Buckingham from 1705-8. He left his MSS, to the Bodleian Library, and his collection of coins to Oxford

University. He published A Survey of the Cathedrals (1727-30).

Willis, Nathaniel Parker (1806-67), an American writer, born at Portland, Maine. His first real success was obtained in 1831 with Pencillings by the Way, but five years later his Inklings of Adventure secured his reputa-tion. The year before his Melaine and other Poems had been successfully produced in England, and he subsequently produced Letters from Under a Bridge; Dashes at Life; Outdoors at Idlewild, 1854; and Paul Fane, 1857. He was for a time foreign correspondent to the New Mirror.

Willis's Rooms, see ALMACK's. Will-o'-the-Wisp, see IGNIS FATUUS.
Will-o'-the-Wisp, see IGNIS FATUUS.
Will-o'-the-Wisp, see IGNIS FATUUS.
Will-o'-the-Wisp, see IGNIS FATUUS.

ricultural

interests. Pop. about 6000.

Willoughby, Sir Hugh (d. 1554), an English navigator and explorer. In 1553 he sailed from Deptford in command of an expedition to China, arranged by the merchants of London, and died with sixty-two men of scurvy off Lapland. His colleague. Richard Chancellor (q.v.), went on a different route and escaped his fate.

Willow, a name given to those members of the genus Salix, which are not osiers or sallows. They grow readily on damp soil and the Huntingdon or white W., grows rapidly to a heigh of 70 or 80 ft., and is a usely the heigh of the sallow ful timber tree, as too is the Bedford or Russell's W. But the most valu-able is the cricket but W., a variety which originated in Norfolk and has

been extensively planted.
Willow Moth (Caradrina), a genus
of night moths. The caterpillar of C. quadripunciata often does damage to

stored grain.

Willowmore, a tn., Cape prov., S. Africa, 185 m. by rail W.N.W. of Port Elizabeth, exports molair, wool,

paper, tin. and iron goods. Pop. an Irish playwright, born at Kil(1910) 11,230.

Willington, an urban dist., Durham.
England, on the Wear, 5 m. N. of
Bishop Auckland; has collieries and
stone-quarries. Pop. (1911) 8731.

Willington Quay a transport part of the words and plays

Willington Chay a transport part of the words and plays

Willington Chay a transport part of the words and plays

On the words and plays the words and plays a transport part of the words and plays a transport part of the words and plays are provided with the words are provided wi and being considerably gifted with the dramatic instinct won some type, 2 m. S.W. of North Shields, that shipbuilding works, coppersmelting, lead, firebrick, and ropemaking works. Pop. 7000.

Willis, Browne (1682-1760), and English antiquary, born at Blandford St. Mary. He was member 1997.

Wills, William John (1831-61), an Australian explorer, born at Totnes in Devonshire. He emigrated to Victoria in 1853, and became surveyor of the Crown lands (1855) and assistant at the magnetic observatory at Melbourno (1858). With O'Hara Burke (q.v.) he explored the interior (1860-61), but all the men but one of the expedition perished for lack of provision near Cooper's Creek. His journal of the expedition was edited by his father, under the title Wills'

by his tattier, under the Successful Exploration through the Interior of Australia, 1863.

The power than the p of making a will or testament of personal property (see Personalty; PERSONAL PROPERTY) has existed in England from very early times, but for centuries the common law and feudal archaisms operated to prohibit the disposition of land by will. and the power to make a will of lands was only acquired through the equitable doctrine of uses and trusts after much legislation, and considerable conflict between the courts of common law and equity (see Liand Laws; Uses). At common law a will might be nuneupative (see NUNCUPATIVE Will, but at the present day the combined effect of the restrictions as to oral wills and testaments, and the requirements of the Wills Act, 1837, is to make it essential in practically every ease to employ writing. Most wills, including codicils (q.r.), to be valid must be signed at the end of the will by the testator, or some other person in his presence, and by his direction, and such signature must be either made or acknowledged by the testator in the presence of at least two witnesses present at the same time, and such witnesses must attest the will in the presence of the testator. Any instrument executed in above manner, may take effect as a will, provided the intention was that it should not operate till after the death of the donor; and again, a duly executed instrument, described as and ostrich feathers. Pop. 5000.
Willow Wren, see Warblins.
Wills, William Gorman (1828-91), was intended to take effect in the

tion: or sign a memorandum at the end of the will referring to the alteracan, however, be validated by a codicil, confirming the will (see also EVIDENCE). A will is in all cases revocable, even though the testator may expressly declare it to be irrevocable. Every will is now construed with reference to the estate, real or personal, comprised in it, to 'speak from death' or, in other words, to take effect as if it had been executed immediately before the death of the testator, unless a contrary intention appears by the will; which last words, however, only relate to the question of what property passes by the instrument, and do not mean that whatever the testator says in his will is to be interpreted as if the will were made on the day of his death. As regards personal property there is no restriction as to what a person may bequeath by his will, whether his interest in such property be one that is then actually vested, or only contingent or executory; and a person may validly dispose of property acquired subsequently to the making of his will. As regards land it is to be noted that the restrictions on testamentary disposition are only such as arise from the limitations of the particular subject-matter (see ESTATE; LIMITATION; LAND LAWS; and and SETTLEMENT); there is nothing to prevent a person from devising land to which he is absolutely entitled in fee simple; but of course if he have no more than a frechold interest for his own life he will have nothing to dispose of at his death in default of some power of appointment vested in him (see POWIE). Every person of sane mind, except an infant (g.v.), can make a valid will; and every person of age can be an attesting witrevoked by a subsequent will or tion on the heir (see Inheritance) codicil; or by a writing declaratory to implement (q,v). Since 1868 any of an intention to revoke and duly one not under any specific disability executed like a will; or by destruction, burning, tearing, cancellation, burning, tearing, cancellation, pleases, excluding his legal successor, to revoke by such destruction, etc., by a testament or will, or by any or by marriage of the testator, subsequent to the date of the will (this does not apply to wills made in exertance).

absence of a more formal instrument. cise of a power of appointment). The Any alteration in a will, made after only way to revive a revoked will is its execution, must itself be executed in the same way as a will, but an ishowing an intention to revive it. By alteration is sufficiently executed if the testator and the witnesses sign testament shall be held to be revoked their names in the margin, or in some place opposite, or close to, the alteration or controlled the presson of any emberoment altered in the presson of any emberoment altered. by reason of any subsequent change of domicile (q.v.) of the person making the same. Where a beneficiary under a will pre-deceases the testator, the gift lapses except in certain cases (see LAPSE). A bequest or device to two LAPSE). A bequest or device to two or more persons by name, or by a general description of them as a class (e.g., 'the nephews of X') is construed as a joint gift (see also Joint Tenancy), and where any of the joint donees predecease the testator, their shares go to the surviving joint donees. On the other hand the donees will take 'in common' (see Common Tenancy) if the testator COMMON TENANCY) if the testator has used words implying separate interests (e.g. 'equally,' or 'among'). But a gift to a class, even though as But a girt to a class, even though as tenants in common, e.g., a bequest of '£10,000 to the children of X in equal shares' will be construed as a gift to such of the children of X as shall be living at the death of the testator, and the predecease of any one of them does not cause a lapse.

A person, as noted above, must be of sound mind if his will is to be valid: of sound mind it his will is to be valid; this means that he must have an 'understanding of the nature of the business in which he is engaged, recollection of the property he means to dispose of, of the persons who have a claim to be the objects of his bounty, and the manner in which it is to be distributed'; and where he is subject to delusions with regard to persons who would be the natural objects of his bounty, his will, while he is under the influence of such delusions, is invalid. Delusions, however, that leave the general power of under-standing unaffected and which are in no way connected with the testator's testamentary dispositions, will not affect his capacity to make a will (Theobald on Wills). (See also UNDUE INTLUENCE.) In Scotland the law as person of age can be an attesting wit-influence.) In Scotland the law as ness, including a creditor, or an to wills and testaments is very similar executor: but where the will pur-in effect. Prior to 1868 the most ports to make a gift to the spouse of clearly expressed will not only was an attesting witness the attestation ineffectual to dispose of land, but was is good, but the gift void. A will is not even held to impose any obligarevoked by a subsequent will or tion on the heir (see Inherstance) codicit; or by a writing declaratory to implement (q.v.). Since 1868 any

means merely 'any written declaration of what a person wills to be done with his movable estate after his death.' It, therefore, embraces all willna, see VILNA.

Wilmslow, a small tn. in Cheshire, England, on the Bollin, 51 m. S.S.W. of Stockport. Pop. (1911) \$153.

Wilna, see VILNA. means merely 'any written declarawith his movable estate after his death. It, therefore, embraces all forms of deeds granted in anticipa-tion of death, besides testaments. The term 'testament' is the proper technical term for what in English law is called a will. Formerly it was not competent to any one to dispose of his land by testament, but since the Act of 1868 above noticed, that re-striction has ceased to exist, with the result that the terms will and testament are virtually synonymous. The Wills Act, 1837, does not apply to Scotland, but so far as form is concerned, there is no great difference between a Scottish and an English will, except that a holograph will requires no attestation, though every other kind of will does (see Holograph). See also Executors; Probate.

Will's Coffee House, a famous convivial resort in Russell Street, London, originally called 'The Red Cow,' then 'The Rose,' Dryden first made it famous among the wits of the period, and after his death it was frequented by Pope. These 18th-century coffee houses gave rise to the modern clubs. See Timbs's Club Life in

London.

Wilmerding, a tn., Allegheny co., Pennsylvania, U.S.A., 13 m. E. of Pittsburg. Pop. (1910) 6133.

Wilmington: 1. A co. seat of New Castle co., Delaware, U.S.A., on the Delaware R., 27 m. S.W. of Philadelphia. Among its notable buildings are the Old Swedes' Church (1698), Ferris Industrial School, and Friends' School. Its manufs. include paper, machinery, railway carriages, and leather. There are large shipbuilding yards. Sec Powell's Historic Towns of the Middle States, 1899. Pop. (1910) 87,411. 2. A co. scat of New Hanover co., N. Carolina, U.S.A., on the Cape Fear R., 20 m. from the sea. It has cotton-seed oil mills, naval stores, dyo works, lumber mills, etc. Pop. (1910) 25,748.

Wilmot, David (1814-68), an American legislator, born at Bethany in Pennsylvania. He began to practise

(1845-51). He was t bill for the purchase of :.

Wilmot,

EARL OF. Wilmot, JOHN, second EARL OF.

Wilsden, a small tn. in the W. Riding of Yorkshire, England, 4 m. S.E. of Keighley. Worsted is manufactured here. Pop. (1911) 2958.

Wilson, a co. seat of Wilson co., N. Carolina, U.S.A., with manufs, of tobacco, cotton, wagons, oil, etc.

Pop. (1910) 6717.

Wilson, Andrew (1831-81), a tm-ller, born at Bombay. He was veller, born at Bombay. He was editor of the China Mail, and the Bombay Gazette, and also contributed to Blackwood's Magazine, but he is best known for The Abode of Snow (1875), an account of his travels in China and Tibet, and The Ever Victorious Army (1868) which sets forth Gordon's Chinese campaigns.

Wilson, Sir Daniel (1816-92), an archeologist, poet, and scholar, born at Edinburgh. He went to London in 1837, but subsequently returned to Edinburgh and published Memorials of Edinburgh in the Olden Time, 1847, and Archaelogy and Prehistoric and Archwology and Prehistoric Annals of Scotland, 1851. After this he went to Canada and became professor of history and English litera-ture at Toronto University, 1853, ultimately being elected president. 1881. He also published Caliban, the Missing Link; The New Atlantis; The Right-Hand Left-Handedness; The Anthropology.

Wilson, Henry (1812-73), vice-president of the U.S.A., born at Farmington, New Hampshire. He was for a time a shoemaker, but in 1840 was elected to the Massachusetts legislature and state senate, entering the U.S. Senate in 1855. He was chair-man of the important committee on military affairs during the Civil War. and in 1873 became vice-president with Grant. His chief work was History of the Rise and Fall of the Slave Power in America, 1872-75; but he also wrote Anti-Slavery Measures in Congress, 1861; and Military Measures in Congress, 1868.

Wilson, Horace Hayman (1786-1860), an English orientalist, born in Pennsylvania. He began to practise as a barrister at Wilkesbarre in 1834, London. He was appointed assistant-and represented Pennsylvania as a London. He was appointed assistant-to the East India Company and while in Bengal made and specific to the East India Company and while in Bengal made and while in Bengal made and specific to the East India Company and while in Bengal made and specific to the East India Company and while in Bengal made and specific to the East India Company and while in Bengal made and specific to the East India Company and while in Bengal made and specific to the East India Company and while in Bengal made and the East India Company and while in Bengal made and the East India Company and the Was appointed assistant-

udy of Sanskrit. He became of studies at the Hindu

bill for the purchase of the introduction by which he opposed the introduction of slavery into the new territory. He sat in the Senate (1861-63), and was appointed judge in the Court of Claims (1863-68).

Claims (1863-68).

Claims (1863-68).

College, Benares (1819, Boden professor of Sanskrit at Oxford (1832).

Iteration to the East India Company (1836), and director of the Royal Claims (1837-60). He published a Sanskrit-English Dictionary (1837-60). John, see Rochester, 1805-35 (1846), and translated The Rig-Veda Sankila (1850-57), etc.

Oxford, where he won the Newdigate Prize in 1806. He settled at Elleray on Windermere, and led the life of a on windermere, and led the life of a country gentleman, but losing his fortune in 1815, owing to a dishonest trustee, he was in that year called to the bar. The law, however, made no appeal to him, and it was to literature that he turned to provide him with a living. Already in 1810 he had and living. Already in 1812 he had published a volume of poetry, The Isle of Palms, and in 1816 he issued The City of the Plague and other Poems. With the establishment of Blackwood's Magazine in 1817 W. came into prominence. He was one of the original minence. He was one of the original staff and a regular contributor. In 1820 W., for no other reason than that he was a Tory, was elected to the chair of moral philosophy at Edinburgh University. In Blackwood's appeared his Lights and Shadows of Scottish Life (1822), The Trials of Margaret Lyndsay (1823), The Foresters (1825); but it is as the author of the Nectes Ambrosiang that he is hest the Necles Ambrosiana that he is best remembered, and in those papers he displayed to the full his admirable literary gifts. His works were collected in 1855-58 by his son-in-law. Professor Ferrier; and there is a biography by his daughter, Mrs.

Recurick Advertiser (1832), published Tales of the Borders (1834-35), and gave popular lectures.

Wilson. Richard (1714-82),English painter. A native of Penegoes, Montgomeryshire, he studied art in London and afterwards in Italy. He was among the original members of the Royal Academy, founded in 1768, while subsequently he was appointed librarian to that body; yet his pictures were but little in demand during his lifetime, and it was not till many years after his death that he became recognised as one of the greatest English masters of landscape-painting. There are numerous works from his brush in the National Gallery, while there are several in the Glasgow! Municipal Museum, and others in the National Gallery of Scotland. Wilson, Thomas (c. 1525-81), a

secretary of state and critic, born in "as educated at

where he came

if the revival of the study of Greek led by Cheke, Sir Thomas Smith, and others. His first important work was The Rule of

Wilson, John (1785-1854), who 1555-60 he was on the continent, and wrote under the pseudonym of on his return was admitted advocate 'Christopher North,' was educated at in the court of arches. He was M.P. in the court of arches. He was M.P. for Michael Borough (1563-67) and for Lincoln (1572-81), and in 1578 was made a privy councillor and secretary of state. He was also employed on various diplomatic missions, especially to the Netherlands. He published. besides the works above mentioned. The Three Orations of Demosthenes (1570), the earliest English translation from Demosthenes.

Wilson, Thomas Woodrow-(b. 1856), wison, i nomas woodrow-(0.1856), president of the U.S.A., born at Staunton, Va. He received his early education in the South, at home in Georgia, and graduated at Princeton University (1879). He took the graduate course in history at John Hopkins University, and was ap-pointed professor of jurisprudence at Princeton (1890), and made president of Princeton (1902). After a success-ful career he became governor of New Jersey (1911). Stood for nomination for presidency of U.S.A. on Democrat ticket in 1912, and was elected by an overwhelming majority. He married in 1885 Miss Helen Louise Axson, and has three daughters. He is the third Democrat president of the U.S.A., and is an effective politician. He pledged himself to and carried through Brotesor rerner; and there is a pleaged limited to the dark through blography by his daughter, Mrs. Gordon (1862).

Wilson, John Mackay (1804-35), an promised a campaign against the trusts. Two of the first acts of his English writer, born at Berwick-on-government in foreign affairs were Tweed. He became editor of the the recognition of the Chinese Republic and the refusal to recognise the Huerta government in Mexico.

Wilson Steamship Line was founded wilson steamship Line was founded in 1835 by Mr. Thomas Wilson of Hull. Its steamships run between Hull and the ports of Northern Europe, the Mediterranean, and the Black Sea, and also visit New York, Boston, and Bombay. In 1910 its vessels numbered 87, and their gross tonnage was 190,278 tons.

Wilton, a market tn. and municipal or., Wiltshire, England, 3 m. bor., Wiltshire, England, 3 m. W.N.W. of Salisbury; has been celebrated for its carpets since the time or Elizabeth. It was the seat of a bishopric until 1975, and was the capital of Wessex. Wilton House, seat of the Earls of Pembroke, has mementoes of Sir Philip Sidney, Holbein, Vandyck, Ben Jonson, and Inigo Jones. W. gave its name to the county. Pop. (1911) 8079.

Willishire, a S.W. co. of England.

Wiltshire, a S.W. co. of England, bounded N. by Gloucestershire, S. by Dorsetshire, E. by Berkshire, and W. by Somersetshire. The surface is for the most part hilly, and includes Salisbury Plain (20 m. by 16 m.) in the S. some 400 ft. above see Joyn Reason (1551), and this was followed the S., some 400 ft. above sea-level, by The Arte of Rhetorique (1553), 'the with the North Downs forming its first criticism in our language.' From northern border, and to the N.E. the

Marlborough Downs and Savernake Forest. The principal rivers are the Kennet, the Lower or Bristol Avon, and the Salisbury Avon. There are also the Thames and Severn Canal, the Wilts and Berks Canal, and the Kennet and Avon Canal. Nearly the whole county is under cultivation; oats is the main crop; large numbers of sheep are reared, and a considerable area is under permanent pasture. Dairy-farming flourishes, and there are condensed milk manufactories. At Swindon there are locomotive works belonging to the Great Western Railway: at Devizes large engineering works: cloth and carpets are also manufactured at Trowbridge, Wilton, etc. There are iron mines near Westbury and Bath, and Portland stone is quarried. Salisbury (q.v.) (17,117) is the county town. The county returns five members to parliament. W. is famous for its antiquarian relics. especially the Druidical remains at Stonehenge and Avebury, while the camp of Vespasian near Amesbury is equally interesting. Wans Dyke is a relic of the Romans, and there are numerous ecclesiastical ruins of later periods, including the abbeys of Malmesbury, Lacock, and Edington. The Saxon church of St. Lawrence at Bradford-on-Avon is also notable. Salisbury cathedral is a fine example of the Early English, and the parish churches are many of them of great There are castle ruins at interest. Old Sarum, Marlborough, and De-vizes, and Wardour Castle, dating from the 18th century, has a fine col-lection of curios, including the famous Glastonbury Cup. Glastonbury Cup.' A number of fine old mansions are dotted about inty. The area is \$64,101 Pop. 286,822. See Victoria the county. acres. County History : Willshire.

Wimbledon, a tn. in Surrey, England, S m. S.W. of St. Paul's, London. The annual meetings of the National

Wimborne Minster, a market tn., Dorsetshire, England, 6 m. N. of Poole; is an agricultural centre. The minster, dating from the Conquest, has a 14th-century lunar orrery. Pop. (1911) 3711.

Winchcomb, a market tn.. Gloucestershire, England, 7 m. N.E. of Cheltenham, has flour-mills, paper count von Bünau at Dresden. Count von Bünau at Dres

Winchendon, a tn., Worcester e., Massachusetts, U.S.A., 36 m. N. by W. of Worcester, Manuk, etter goods, machinery, and furniture, Per. 5800.

Winchester, a cathedral city and municipal and parl, bor, of Hampshire, England, on the Itchen, 12 m. N.E. of Southampton. The Same kings of Wessex are said to have been crowned in the old cathedral, of which no traces remain. The present call-dral was creeted by Bishop Walking drai was erected by bisnop warrant in the 11th century. Additions were made by William of Wyksham and others, so that the styles of artitecture vary from Norman to Propendicular. It is the longest eathers (557 ft.) in England, with a nave of 351 ft. It contains the tombs of Carding Beautory Lyndy Wyllan and Cardinal Beaufort, Izaak Walten, 22 Jane Austin, and a shrine to S. Swithin. Not far from the cathed lie the ruins of Wolvesey Castle, and to the N. those of Hyde Aber in which King Alfred was buried. The county court is held in the hall c's medieval castle on Castle Hill, which contains the famous relic known to . Arthur's Round Table. The College of St. Mary, better known & Winchester College, was founded by William of Wykcham in 1887. Consult works by Dean Kitchin (likew) SHE WORKS BY Dean Kitchin (History Towns Series, 1891), I/E-tann (1889); Leach, History of Windset College, 1899; and Windseth, History, Buildings, and People (12) by P. and G. Wells). 2. A to Middlesex co., Massachusett, U.S. Sm. N.W. of Boston. It has a leaf for Agrad People State Arises Sp. for Ared People, State Aviary, Si.
Park (known as 'Middlesex Fast and manufs. of felt and macha-Pop. (1910) 9309. 3. 4 th. of Life field co., Connecticut. Pop. [18] 8679. 4. The cap. of Frederick Virginia, with manufs. of least the control of the contr and, S.m. S.W. of St. Paul's, London.
The annual meetings of the National Rifle Association were formerly held on Wimbledon Common (1860-89). Seat of Blark co., Kentuck, Find British earthwork. Pop. (1911)54,876. Wimborne Minster, a market tn., Wesleyan College. Pop. (1912) Dorsetshire, England, 6 m. N. of 7156

Jesth' Johann Winckelmann, (1717-68), a German art eritle, ler. Stendal in Prussia, the son of a ? shoemaker. Educated at Halla es Jena, he began life as a private to and in 1748 became libraria Winchelsea, a market tn. and Surgestion he settled in Rome Cinque Port, Sussex, England, 2 m. surgestion he settled in Rome Portangue Port, Old Winchelsea, an important scaport in Saxon times, was destroyed by the sea about 1288. Cardinal Albani (1759), finally bearing antiquery of the apostole destroyed to the sea about 1288. ber (1763). He was murdered at trade Ws. are reversed in summer and Trieste by an Italian to whom he had shown some gold coins. W. was a great exponent of classic art, and is regarded as the founder of scientific archæology. His chief works are Geschichte der Kunst des Alterthums

Geschichte der Kunst des Alterthums (1764) and Monumenti Antichi Inediti (1767-68). See Goethe, Winckelmann und sein Jahrhundert, 1805; and Life by Justi (1866-73).

Wind. The Ws. or lateral movements of the earth's atmosphere are determined by the distribution of pressure within that fluid, movement taking place from bigh to law pressure. taking place from high to low pressure indirectly. The theory of Ws. as worked out by Ferrel and others discusses primarily planetary Ws., those which would occur on a homogeneous planetary body on account of its relation to the sun and the distribution of radiation received. For the earth the results are supposed to be zones the results are supposed to be zones of calm—at the equator due to ascending air currents, near Cancer and Capricorn, and at the poles due to descending currents. The intervening belts on either side of the equator have thus equator-sceking Ws.; on the polar sides of the tropical calms, pole-seeking Ws. Theory is, however, far from perfect, and the distribution and direction of Ws. at different levels in the atmosphere is extremely uncerin the atmosphere is extremely uncertain. Poleward Ws. are deflected to the E. equator-seeking winds to the W., by the influence of the earth's rotation. The atmosphere partakes of the earth's motion of rotation, and a W. has in its earliest course a com-ponent velocity corresponding to its latitude. On reaching different latitudes this becomes a defect or excess of that of the earth's surface it now passes over, and the W. lags' or leads'; the resultant course is thus curved. The trade Ws. blowing into equatorial low pressure are N.E. curved. The trade Ws. blowing into equatorial low pressure are N.E. and S.E., curving more and more westwards. The Ws. blowing polewards from the tropical calms are N.W. or S.W., and curve more and more eastwards. In the S. hemisphere they are well developed as the Roaring Forties. The planetary Ws. swing N. and S. with the sun, but over much less latitude. Terresbut over much less latitude. Terrestrial winds.—The earth's surface is d water nd rises more ral pressure varies oppositely to temperature, a definite disturbance of planetary Ws. is caused. The tendency is for Ws. to blow into the continue.

doldrums and joining the S.W. mon-soon, as the reversed Ws. are called. These periodic Ws. form a separate class to the prevailing Ws., which are cause to the prevaiting ws., which are constant throughout the year. Marked deflection of planetary Ws. is also noted in Australia, S. Africa, and S. America, where the S.E. trades are drawn more westwards during urawn more westwards during summer on to the E. coasts. They are also drawn over Nigeria from the Gulf of Guinea. In N. America the plateau of Mexico and the arid and high regions of Western U.S.A. similarly draw the N.E. trades eastwards. This effect is added to by the opposition of coast lines, particularly if mountainous, to the passage of surface Ws., with the result that round areas of tropical high-pressures in each ocean the Ws. tend to form vast anticyclonic systems, clockwise in the N., anticlockwise in the S. hemispheres. In the N. oceans beyond these systems huge cyclonic systems form. It is these systems, which are strongly modified planetary Ws., that form the real W. systems of the world. Towards the equator they are steady and gentle, but towards the pole, until the Arctic regions are reached, they are disturbed by constant eddying, due to mingling of surface and upper currents, the westerlies being characterised by a constant succession of such cyclonic storms. Local winds.—Of chief importance are those induced by mountain masses, which change or intensity prevailing Ws. Elevated masses of land, above the clouds and humid atmosphere, respond more readily to the sun's influence, and suffer extremes of temperature day and night, summer and winter. day-time and during summer they heat the air and cause up-draughts, and vice versa at night and during winter; with other complications this helps to form Föhn and Chimook Ws., the bora, northers, etc. Land and sea breezes are caused in warm calm regions by the different reactions to the sun's rays. Violent storms such as tornadoes and typhoons are largely developed on the margin of the equatorial calms. Ws. of the upper atmosphere are very little known; it seems probable that there is a general drift of cold air, poleward and east-ward, above the trades. The force of ward, above the trades. The force of W. is measured by the anemometer (q.v.); it is expressed in lbs.-pressure per sq. in. The Beaufort scale, arranged in 1805 by Sir F. Beaufort, was based on the amount of sail a ship blow into the continents in summer and out from them in winter. This is ranged in 1805 to only established over Eurasia to any general extent, but it is markedly so could safely carry on the S. and E. of Asia, where the it may be given: could safely carry; in its modern form

blow landwards, the trades of the

Indian Ocean obliterating the

12

Hurricane

			Miles per hr.	
0	Calm	•	. 3	Moving leaves.
$\frac{1}{2}$	Light air Light breeze	:	. 8 . 13	Moving branches,
3 4	Gentle "		. 18	Swaying branches; blowing up dust.
5	Fresh ,, Strong	:	. 28 . 34	Swaying trees; blowing up twigs,
7	Moderate gale	:	. 40	
8 9	Fresh ., Strong ,,	:	. 48 . 56	Breaking branches : damaging heardin and signs, or deficient brickwork.
10	Whole "		. 65	,
11	Storm .		. 75	Destroying buildings not thorough

For local Ws. see separate titles. See peared in 1913, with an introduction Buchan, Report on Atmospheric Cirby Lord Rosebery. culation, 1889: Ferrel, A Popular Windhoek, a settlement, cap. of Treatise on the Winds, 1893; Bartholo-German S.W. Africa. It has not Treatise on the Winds, 1893; Bartholo- German S. M. Alica. It has now mew and Herbertson. Allas of Melcoro- thermal springs, and is connected by logy, 1899; Pomortzeff, The Law of railway with Swakopmund on the Distribution of the Velocity of coast, and with Keetmanshoop (a dis-Winds, 1894; and The Beaufort Scale tance of 380 m.).

Wind Force, 1906.

Wind Instruments are of three

. 90

indented and wooded, growing steeper towards the N. It drains into Moretambe Bay through the Leven. 2. A tn. of Westmorland, England, 7 m. W.N.W. of Kendal. Pop. 5117.

Windflower, see ANEMONE. Windgalls, in horses, s horses, swellings occurring at the fetlocks and due to an

statesman, as a young man became In the friend of Johnson and Burke. 1783 he became chief secretary to the Lord-Lieutenant of Ireland, but only held office for a short time, and in the following year entered parliament. Under Pitt he was, from 1791-1801, Secretary for Wan with a seat in the Cabinet, and in 1806, where is the Grove villeadminis for War and

liant and loyal, but his changes of on manuac terms with min. Its process of all axes with their interspectes were published by Amyott slightly inclined to the plane of the in 1806. A selection from his diary sails, as in the screw propeller or was edited by Mrs. Henry Baring in ventilating fan: if these are held 1866. The Windham Papers, a colfacing the wind its force is resolved lection of his correspondence, apinto a strain and a component

substantial.

Winds, 1894; and The Beaufort Scate tance of 300 m.). Wind Force, 1906.

Windau, a scaport of Courland, classes: (1) keyboard, e.g. organ, con-Russia, at the mouth of the R. Windau, which here forms a small harbour. It has important fisheries and exports timber. Pop. 7150.

Windermere: 1. The largest lake windermere: 1. The largest lake of horn, trumpet, trombone, and in England (11 m. by 1 m. broad), on other instruments with cup-shaped the boundary of Westmorland and mouthpieces.

Lancashire. Its shores are much windlass, a machine used for lift-indextdand wooded crowing steeper ing weights through a considerable

ing weights through a considerable distance, as in raising water from a It is a modification of the well. wheel and axle (q.r.), and consists of a cylindrical roller made to rotate upon its axis by a crank and handle. The weight is attached to a long rope which is coiled round the roller as the

accumulation of fluid about the joints. handle is turned.

They are usually caused by hard work, and may disappear on the borse being rested for some time. Heven to have been introduced as long ago as a thousand years. There windham, William (1750-1810), a were two forms of the old-fashioned at the formula and the latter. In type, the German and the Dutch. In the former the whole mill was supported on a post round which it could be turned for the sails to catch the wind; in the latter a more substantial fixed body was erected of wood, brick, or stone, only the upper part revolving. Turning was per-tormed by hand in both cases, by means of cog-wheels working on a rack fixed round the support. In the Dutch type, where the movable mass opinion carned him the nickname of had much less weight, an automate 'Weathercock W.' He assisted Cob-device was applied, consisting of an bett in 1802 to found the Political auxiliary vane or 'fan-tail.' The Register, and was for some years wind acts on four or more salls on intimate terms with him. His pivoted on an axle with their faces

rotate them on the axle. The rotation of this was transmitted by means of bevelled cog-wheels to a shaft driving the mill wheels. The 'fantail, placed on a long arm on the opposite side of the mill, by virtue of its leverage, kept in the direction of the wind, thus keeping the sails at right angles to that direction. modern American W. a similar tail serves the same purpose. By supplying a vaned wheel instead of a tail, its rotary motion was transmitted to the mechanism for adjusting the angle of the sails, so that they always faced the direction of a varying wind. The sails are inclined backwards from their pivoting, and the plane of revolution is also inclined to clear the lower part of the tower; they are 20 to 40 ft. in length. When of canvas on a frame, arrangement was usually made for reefing in order to adjust speed to the velocity of the wind. In many cases slats or flaps of thin wood were used and the angle of these could be adjusted. Such W. have become almost obsolete, at any rate not being replaced as they become dilapidated, owing to the introduc-tion of steam engines, and later gas and oil motors. On the other hand, the modern American light and effitype, an outcome Ωf genuine improvement in engineering materials, knowledge, and method, has been largely adopted for working water-pumps, to supply farms and houses with their own water. The sails of these are of steel and arranged more numerously and closely to a wheel, as in the ventilating fan; the strips are thin, narrow, and concave for lubricating are used, and a bandbrake worked automatically by the the Gothic st tail in its movement regulates the dows derive speed. for starting or stopping the move-selves, the very mullions, transoms, ment from the base of the tower. The and tracery forming an exquisite motion of the axle may be trans-design and decoration. See Archiinotion of the axle may be transmitted direct or through gearing and a separate crank axle to the long piston rod of the pump. The axle is set to one side, while the tail axis range of mountains in W. Wyoning, passes through the centre; by this means the power of the tail is increased, and in gusty or rough weather the wheel is thrown 'out of the wind,' and the speed thus of the wind,' and the speed thus steadied. Some American W. are gradeleds, the wind-wheel being 21½ m. from London. It contains a placed on the lee side of the tower.

vertical to the inclined faces which used; others have solid instead of sectional wheels, and are governed by a side vane; but the patterns are very numerous. Power increases at a very numerous. Power increases at a slightly greater rate than the square of the wind velocity. A 12 ft. mill should furnish 1 h.p. in a 20 m., 14 h.p. in a 25 m. wind. A 25 ft. mill should raise one-third of an acre-foot of water to a height of 25 ft. in a working day of eight hours. The economy is reckoned as 1.5 that of a steam-nump around the steam-nump lase. steam-pump, expenditure being less in repairs, and none for fuel and practically none for attendance; there is no supply of water needed. On the other hand, uncertainty of wind demands large storage arrangements. See J. A. Griffiths, Windmills for Raising Water, Proc. Inst. C. E., vol. exix. No. 2672, 1895; E. C. Murphy, The Windmill, its Efficiency and Economic Use, Water Supply Papers, U. S. Geol. Survey, 1901; A. R. Wolff, The Windmill as a Prime Mover, 1890.
Window, an opening in the wall of wind demands large storage arrange-

Window, an opening in the wall of a building for the admission of light and air, but not for purposes of in-gress and egress. As an architectural feature windows play a very small part in the ancient architectures of Egypt, Greece, and Rome. In the Gothic and later styles, however, they are exceedingly important features for every class of buildings. In the Gothic especially they are so characteristic by their general forms and proportions, as well as their decoration and details, as to be in that style equivalent to what the orders are in the temple architecture of antiquity. In architectural design, it is quite contrary to the fundamental printowards the wind. The apparatus is ciples of the art to leave window and provided with a tail, the whole being similar openings as mere naked gaps balanced on a pivot at the top of a in the wall, and hence they require light tower of girder steel work. The 'dressings,' or borders, to give an air axle is inclined slightly or horizontal of finish and completeness. Doors in different patterns. Ball thrust or and windows are, therefore, the first roller bearings with arrangement, features in a 'hment. One of of

> dows derive strong architectural ex-An arrangement is provided pression from the apertures them-

placed on the lee side of the tower, town hall built by Sir Christopher In many, a centrifugal governor is Wren in 1686, the church of St. John

the Baptist, with fine examples of guished politician, and after the an-Grinling Gibbon's wood-carving, and nexation of Hanover by Prussia be a fine Jubilee statue of Queen Vic-toria; but it owes its importance to toria; but it owes its importance to the castle, which is one of the principal royal residences. The tn. was formerly famous for its inns, one of which, the Garter, is frequently mentioned by Shakespeare. Pop. 15,370. 2. A city and port of entry of Essex co., Ontario, Canada, on the Detroit R. The chief manufactories are the Canadian Salt Company, paint government of the W. I. is made up and varnish works, flour mills, can of the three colonies of Grenada (the and varnish works flour mills, can-ning factories, and boiler and ma-chine shops. It is the centre of an agricultural and fruit-growing district, and during the navigation scason has a large trade in the Great Lakes. Pop. 17,829. 3. A scaport tn. of Canada. cap. of Hants co., Nova Scotia. It has a considerable export trade in the gypsum and limestone of the region. Its chief institution is King's College or Wind-sor University, founded in 1788. Pon. 3625.

Windsor Castle, one of the bestknown among the royal and palatial edifices of Europe, is in a manner to England what Versailles is to France and the Escurial to Spain. But while it is infinitely superior to both in point of situation, it far exceeds them state and arrangement until the 14th century, when extensive building operations were carried on under the surveyance of William of Wykeham. Under Elizabeth the terraces were formed and the castle was thus given one of its most striking and attractive characteristics. Under the Stuarts nothing material was done until the

Grenada, and Tobago. Of these, Barbados is a separate colony with its own governor, and Tobago is attached to Trinidad. Hence the government of the W. I. is made up of the three colonies of Grenada (the seat of government), St. Vincent, and St. Lucia, with their dependencies, the Grenadines being divided between Grenada and St. Vincent.

Wine, the name given to the ferromands.

Wine, the name given to the fer-mented juice of the grape. The term is also employed to designate alcois also employed to designate alco-holic beverages obtained from the fermentation of the juice expressed from apples, elderberries, rhubarb, etc. The making of W. was well known to the ancients, especially to the Romans. The juice, or 'must' as it is called, expressed from the grape is a viscous liquid consisting of water holding sugars and various organic and inorganic acids and saltin solution. On exposure to the heat of the sun the must spontaneously ferments. In a few days the fermentapoint of situation, it far exceeds them ments. In a lew days the fermenta-and indeed every other pile of build-ing of its class in antiquity. In its present state, however, this anti-quity is little more than nominal. The first structure on the site was cipitate has formed at the bottom that of the Conqueror, but the plan did not begin to assume its present other vessels and lets for a period of several months to complete the after fermentation. At the end of this time all the sugars in the juice have been converted into alcohol and carbon dioxide. The precipitate from the W. is called argol, and consists chirtly of potassium hydrogen tartrate, containing impurities such as calcium and magnesium tartrates. The pronoting material was done that the and magnesium detrates. The pre-Restoration, when the castle began cipitate is formed on account of the to be modernised in a tasteless and decreasing solubility of these sub-in-spid manner. Charles II. added stances in the liquid as it becomes the Star Building. George III. more alcoholic. During fermentation, among other alterations, renovated red Ws. tend to become lighter in in-spid manner.

the Star Building. George III., more accommon. The star Building. George III., more accommon. The star Building. George's Chapel, the interior of St. George's Chapel, colour and less astringent, due to the but the main work of improvement separation of tannin and colouring was left to his successor, under whom extensive alterations were carried of Ws. is carried out by the addition out under the direction of Sir J. of albumin, i-inglass, gum, lime. Wyptt.

Windt, Harry do, see De Windt, (plastering) causes the removal of potassium bitartrate, leaving the acid sulphate of potassium which HARRY. potassium bitartrate, leaving the Windthorst, Ludwig (1812-91), a noid sulphate of potassium which German politician, born near Osnabrück. He was president of the Catholic consistorium, and a judge of contain much sugar are often 'sulthe supreme court of appeal in Hanothe supreme court of the Hanoverian dioxide, to prevent under fermentation. The aroma, or 'bouquet' of a second chamber. He was a distin- W. depends on the particular ethers

shown that the bouquet passes with the ferment from one W. to another. Thus, if a ferment is transferred, the W. fermented by such ferment has the bouquet of the W. from whence the ferment was taken. The vinous odour is due to the presence of cenanthic ether. The amount of alcohol in a W. is determined by the per-centage of sugar in the 'must,' one part of alcohol being produced by the fermentation of about two parts of sugar. As a rule the percentage of alcohol does not exceed 12 to 15 per cent., and such Ws. are termed natural Ws. Extraneous sugar is often added ('doctoring') to increase the percentage of alcohol, and such Ws. are then termed fortified Ws. The name 'dry' Ws. is given to Ws. in which the fermentation of the sugars which the fermentation of the sugars is complete. If fermentation is checked before it is completed, a fruity W. is the result, while sparkling or effervescent Ws. are the result of bottling before fermentation has ceased. The qualities of a good W. are much improved by 'maturing' for several years. The experiments of Pastour, however, have shown that by heating the W. to about 140° F. for a short time it is preserved from deterioration, and also takes on the deterioration, and also takes on the properties of matured W. The colours of particular Ws. may be due to the addition of various colouring matters. Red Ws. owe their colour to the fact that the skins of the grape are left in the vats during the first fermentation. Light Ws., such as Burgundy, claret, hock, etc., contain from about 8 to 13 per cent. of alcohol, while champagne contains about 15 per cent. and port and sherry often as much as 24 per cent. For the various types of Ws. CHAMPAGNE, CANARY, Bor-DEAUN, BURGUNDY, HOCK, MADEIRA, PORT, SACK, SHERRY, etc.

Winfield, a city and co.-seat of Cowley co., Kansas, U.S.A., on the Walnut R. It has flour-mills, grain elevators, machine shops, and stockyards, and there are limestone quarries in the vicinity. Pop. (1910) 6700.

Winfried, the real name of St.

Wintried, the feat hame of So. Boniface (q.w.).
Wings, see Bird, Flying.
Winifred, St., the patron saint of virgins, probably a native of Wales.
She was beheaded by Prince Caradoc for refusing to submit to his at-

tempted seductions.

Winkelried, Arnold von, a Swiss patriot, who is said to have decided the victory of his compatriots over the Austrians at Sempach in 1386. The enemy formed a dense mass of steel which the Swiss could not penetrate. Seeing this W. grasped a number of the Austrian pikes and buried

present in the liquid. It has been them in his breast, thus creating a gap in the ranks through which the

Swiss rushed over his body.

Winnibago, Lake, the largest lake in Wisconsin, U.S.A. It is connected by Fox R. and Green Bay with the Great Lakes, and has an area of 212 sq. m. Its clear waters are abundantly supplied with fish, and its well-wooded shores, with pretty towns intervening, make it most attractive.

Winnipeg, the cap. of the prov. of Manitoba, Canada, ranks third among the cities of Canada. It is situated at the confluence of the Red and Assiniboine rivers, and is the seat of a university. It is one of the chief banking and financial centres of the Dominion, and is also a great manufacturing centre. Pop. about 200,000.

Winnipeg, Lake, is in the prov. of Manitoba, Canada. It has a length of some 250 m., and is from 5 to 70 m. broad. Its chief tributaries are the Saskatchewan and the Red R., but it also receives the surplus waters of Lakes Winnipegosis and Manitoba, besides the Winnipeg R. The surplus water is discharged by the Nelson R.

into Hudson Bay.

Winnipegosis, Lake, a shallow lake in North-Western Manitoba, extending into Saskatchewan. It has a length of 127 m., and receives the Red Deer and Swan rivers, while it discharges into Lake Manitoba to the

S.E. through the Water Hen R. Winona, a city and co. scat of Winona co., Minnesota, U.S.A., on the Mississippi R. The chief manufacturing establishments are flour and lumber mills, waggon and carriage factories, agricultural implement works, railroad shops, breweries, and patent medicine works. (1910) 18,583.

Winsey, or Wincey, a cloth consisting of wool mixed with cotton. It may be plain or twilled, and usually has a cotton warp and woollen filling.

Winsford, Winsford, an urban dist. of Cheshire, England, on the Weaver, which produces salt. Pop. 10,770.

Winslow, Edward (1595-1655), one of the 'pilgrims' who sailed for America in the Mayflower. He came of an old English family. W. took an active part in the life and organisa-tion of the Plymouth colony in New England and returned to England on one or two occasions as agent for the settlers. He was made governor of the colony in 1624 and was several times re-elected.

Winsor, Justin (1831-97), an American historian, born at Boston. After studying at Harvard and Heidelberg, he was appointed librarian at Boston in 1868, holding this post until 1877,

when he removed to Harvard. He edited the Memorial History of Bos-He ton (4 vols.), 1880-81, and The Narra-tive and Critical History of America (8 vols.), 1884-90, and wrote: Christopher Columbus, 1891; The Mississippi Basin, 1895; The Westward Morement, 1897; Reader's Handbook of the American Revolution, 1879.

Winstanley, Henry (1644-1703), an engineer and engraver, the eldest son of Henry W. (d. 1680) of Saffron Walden. He was clerk of the works the work destroyed. On his release, however, he completed the building, but lost his life in a storm, which swept away the entire structure. He published engravings of Audley End (1676).

Winston, a city, co. seat of Forsyth matics an co., N. Carolina, U.S.A. It is the Haryard. commercial centre of a fertile agricultural region, especially noted for its tobacco, indeed, the growth of W. is chiefly due to this industry, and the manuf, of flat plug tobacco here is especially important. Pop. (1910)

Wint, Peter de (1784-1849), an English landscape painter of Dutch origin, and a 'little master' of the old English school. He studied at the Do W. is best Royal Academy. known for his water colours, which have all the purity and freshness of

the best work of this school.

Winter commences, astronomically, when the sun has attained his lowest declination, i.e., his lowest noon position in the sky. This occurs for the N. hemisphere when the sun enters Capricorn; for the S. when he enters Cancer, that is when he is in the zenith on those tropics. The sun's sun passes his mean noon position. but his fame rests upon his songs and Climatically W. is very varied, cor-lyrics which place him in the first rank responding with a dry season usually, of Danish poets, but in 'Mediterranean' regions with Wintour, John Crawford (1825-82), a wet season. Biologically it is the annual period of suspended animation for many forms of life.

Winterthur, a tn. of Switze the canton of Zurich, with the canton of Zurich, with drawn are generally of cotton goods, including colors rolled to about No. 8 gauge, 123 0.16 and machinery. A good wine is produced in the neighbourhood. Pop. duced in the neighbourhood.

Winthrop Family: John (1588-1649), governor of the colony of Massachusetts (1629-31 and 1637-19). born in Suffolk, England. He sailed from Yarmouth with 900 persons in 1630, and on the voyage composed an essay. A Model of Christian Charity. During his life he had more influence probably than any in forming the political institutions of the northern states of America. John (1606-76). governor of Connecticut, son of the preceding. In 1635 went to Connecto Charles II. at Audley End and licut, built a fort at the mouth of the Newmarket in 1666, and in 1696 Connecticut R., was made governor furnished a design for Eddystone of the colony, and founded the city Lighthouse. In 1697, while super- of New London in 1661. He obtained intending its construction, he was a charter for the colony from Charles carried off by a French privateer and II., and was first appointed governor under it; and, in 1676, represented his colony in the congress of the united colonies at Boston. John, LL.D. (1715-79), an American scholar than the congress of the congress of the control of the congress o born in Massachusetts: in 1738 was appointed Hollis professor of mathematies and natural philosophy at Harvard. He published tracts on earthquakes, comets, and other as-tronomical subjects. Robert Charles. LL.D. (1809-94), an American statesman and orator, born at Boston; graduated at Harvard College in 1828, studied law with Daniel Webster, was admitted to the bar in 1831, and was elected to the state legislature in 1834, where he served five years, three as Speaker of the House. In 1840, he was elected to Congress, of which he was a member

Congress, of which he was a member for ten years. His Addresses and Speeches were published in 1852. Winthur, Rasmus Villads Christian Fordinand (1796 - 1876), a Danish lyrical poet, born in Zenland. He began by writing for periodicals, but in 1828 brought out his first volume of nearway thick contained the charme of poems, which contained the charm-ing set of descriptive verses entitled Woodcuts. It was followed by seven the zenith on those tropics. The sun's or eight volumes of lyrics, and by an rays falling then at the least angle epical romance, The Stay's Flight. W. with the horizon, temperature falls, to also published works in prose, e.g. rise again towards spring when the 1n the Year of Grace, a novel (1871). but his fame rests upon his somes and

of Danish poets.
Wintour, John Crawford (1825-82), Scottish landscape painter. lived chiefly in Edinburgh, but went often to the Highlands or the Bordets Winter's Bark, the bark of Drims in quest of subjects for his art, and, scinteri, an overgreen tree (order Magnolineces). W. B. resembles cinnamon, and is used as a tonic and in cases of scurvy.

Winter's Bark, the bark of Drims in quest of subjects for his art, and, scinteri, and which was a prolific water-colourist also. There is a fine picture from his brush in the Glasgow Municipal

Rods from which

ickled

after being dried the rod is mechanically drawn through dies by being wound on to drums. Modern wire-drawing employs a series of dies, the number being fixed by the amount of reduc-tion the wire will stand before requiring annealing. But it is not possible, without overstraining the inished wire, to pull from the end through all the dies at once, consequently an arrangement of powerdriven drums must be supplied between each set of dies, round which eye generally or by some mechanical the wire is lapped two or three ti

Again, each succeeding drum:

The transmitter in arranges the flashes

Again, each succeeding drum:
revolve at a higher speed than
preceding one, in order to take u:
elongation in the wire. Owing to the
hardening effect due to continuous
cold drawing of steel wire, the amount of reduction is strictly limited, due to the wear on the dies, consequently the process is much more successful when the wire is made of copper or brass. In order to reduce the wire to very small gauges, it must be annealed after so many passes—usually two to six, varying with the amount of rehigh carbon

finest sizes a either diamonds or rubies. Piano-wire of 0.0254 in. diameter may have a

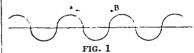
nalling from place to place without the use of wires. From the scientific point of view it really dates from the introduction of Clerk Maxwell's paper before the Royal Society in 1864 on A Dynamical Theory of the Electro-magnetic Field. Electrical Electro-magnetic Field. Electrical means of signalling between stations without the use of wires had been utilised before this time, but they were of very limited application. Signalling by sounds and flashes of light are very old methods, and may be said to fulfil the definition of signalling without wire. In the case of nalling without wires. In the case of sound, the transmitter consists of some vibrating object which sets the air in its vicinity in vibration. These requency of the waves is the number with a velocity of 1100 ft. per second, and are detected by the car at the receiving station. A simple illustration of the propagation of these sound the distance from the crest of a wave waves through the air may be seen in the dropping of a stone into an expectation. These velocity of the waves is the number for complete vibrations per second made by the transmitting agent, the waves through the air may be seen in the distance from the crest of a wave waves through the velocity of the waves through the

The same saving panse of still water. Small concentric waves or ripples in the water are seen to diverge outwards, the concentric rings formed becoming larger and larger as they recede from the centre of the disturbance. Sound waves in the air are analogous to these ripples in some respects. In the case of signalling by flashes of light, the transmitter causes these flashes and so sets the ether in vibration, the vibration travelling through the ether with a velocity of 186,000 m. per second. These vibrations are detected at the receiving station by the

> a generally accepted ally the Morse Code.
> The ether is the medium by which the electrical waves used in wireless telegraphy are transmitted through space. This medium is supposed to be uni-Scien-

versal, existing throughout all space and permeating all matter. tists cannot conceive of any action at a distance, that is to say, without some intervening medium. It is a well-known scientific fact that the atmosphere does not exist beyond duction—so as to re-soften the material. The dies used for ordinary and heat from the heavenly bodies, gauges are made of hard white east Some medium is necessary to transmit these effects, and thus the ether medium. Very about 200 m., and yet we receive light is assumed to be the medium. little is known of the properties of wire of 0.0254 in. diameter may have a transmit vibrations with very tensile strength of over 200 tons per little if any loss of energy. It may sq. in. The carbon content may vary from dead mild, say, less than 0.1 per cent. C. in telegraph wire, up to 0.9 per cent. C. for the best hard wire.

Wireless Telegraphy may be defined as an electrical method of six tion depending on the properties of the medium. In sound the medium is air, in light and electrical signalling the medium is this universal ether. Thus we see the essential apparatus for signalling by the means of waves is (1) a transmitting agent to set the medium in vibration; (2) a suitable receiver to detect the vibrations at the receiving station. The waves set up in the medium may be represented graphically as in Fig. 1.



should be remarked that v is made pendent of the frequency. It has been noticed that it a pamb been stated that both light waves and is played, when a certain note is electric waves are transmitted by the ether, hence they have the same velocity, their difference existing only in their frequency. The eye is affected by receiver consisting of a method his receiver consisting of a by a limited number of waves, the frequency of these waves, which are called light waves, being between the limits 3.73 × 104 and 8.33 × 104 vibrations per second. The waves which occuliate waves which oscillate more slowly are the heat waves by which heat is propagated through space, and those which oscillate still more slowly are the waves utilised in wireless telegraphy. The production of these waves is quite a recent event, being predicted by Clerk Maxwell and confirmed experimentally by Hertz in 1888. Hertz's experiment consisted of producing electric waves by the oscillatory discharge of a condenser. He employed two square plates connected by wires to two small spherical knobs. These plates constitute the condenser. The condenser was charged by knobs. Each discharge gives rise an induction coil. When the potent to a group of waves called a trace tial difference between the knobs train. Thus, after several discharges These plates constitute the condenreaches a certain value it breaks down the air insulation between the knobs and an alternating discharge takes place. Now it is a well-known fact that when a current passes through a wire there is an accompanying magnetic field, and if the current is reversed the magnetic field reverses its polarity. This oscillatory discharge between the knobs is analogous to a

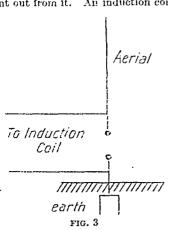
locity of light.

resonance or tuning, a most important method in wireless telegraphy. To wave trains affected by damping, illustrate it simply, consider a large expanse of water. If a cork is dropped apparatus, called the plain acrial, was into it, ripples are seen to diverge in a modification of Hertz's condenser all directions in the form of concentrangement. It consisted of the tric rings, while the cork executes a two balls, one connected to the carth series of up and down motions. If which formed one plate of the condenseries of up and down motions. If which formed one plate of the condensation of the expanse of water, the stretching upwards into the atmosphere of water and give to it an up and down motion; which forms the other plate being wire, and give to it an up and down motion; which forms the other plate of the constinuiar to the first cork. Thus by denser, is called the aerial or antenna, means of the intervening waves the Hoth plates are connected to an exactly leaves the plate of the constitution of the connected to an exactly the state of the content of the connected to an exactly the state of the connected to an exactly state of the connected to an exa

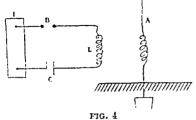
medium, N = the frequency, and L series of small impulses having the wave length, then V = NL, but it same period than by a series of much should be remarked that V is independent of the frequency. It has been noticed that it a piano wire circle having on its ends two small knobs very close together. This is tuned to the transmitter. When the oscillations take place by the discharge of the condenser, a series of sparks will be seen to pass between the knobs in the ring, although held some distance away. In this way Hertz confirmed the fact that electric waves travel through space with the velocity of light. space with the velocity of fight, it may be pointed out that the discharge of the condenser is not continuous, but after each discharge there is an interval before the next, time being required to charge the condenser up to the potential difference necessary to break down there are several wave trains, each separated from the other. If a bell be struck it will be noticed that the sound gradually dies away; this is

due to the damping of the sound waves. This phenomenon of damping also occurs in electric waves, and the waves can only be kept up continuously by giving energy to the system continually. Now in the discharge of the condensation of of the condenser the energy gradually the method of | decreases, and thus waves of the form in Fig. 2 are set up, which shows four

means of the intervening waves the Both plates are connected to an second cork is made to copy the motions of the first cork. This is a plates, resulting in a discharge actorough explanation of what takes the air gap. When this takes place. To state the principle of resonance precisely, it may be said that any mechanical system which can are all to the earth and back again, wibrate with a definite period will be These oscillations soon cease in about much more greatly affected by a a few hundred-thousandths of a



if left to itself, would have charged the the receiving station would receive a series of continuous effects. This would be useless for signalling purposes, it being necessary to regulate the periods between the wave trains m rig. 4, but in addition we have the laternator D and another tronsforthe periods between the wave trains mer or jigger T. To ensure that the or discharges to divide them up into the 'longs' and 'shorts' of the Morse Code. This was effectively done by regulating the supply of the current to the induction coil by means of a switch.



second. The air gap resumes its lower end being earthed. C is a normal condition and the aerial is condenser which is charged by the then ready to receive the next charge from the coil. The process is being at B. The energy passes from then repeated and every time the coil L into the aerial by means of the transformer composed of the tent out from it. An induction coil, is often called the jigger. It is most important that the air-wire be funed to the other system. With this arrangement a much longer series of oscillations could be produced in the aerial for a single charging up or the condenser. In large power stations where the distance to be travelled is much longer, a greater supply of energy is needed, hence in this case an alternator is substituted instead of the induction coils. Fig. 5 gives a dia-

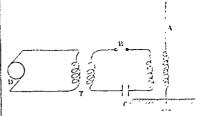
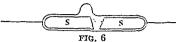


FIG. 5

gram for a large sending station, the letters denoting the same parts as in Fig. 4, but in addition we have the

Receiving instruments.—An aerial is fixed at the receiving station, the the induction control means of assistent is fixed at the receiving solution, the This simple apparatus has several aerial being tuned to that of the transdisadvantages in that its range is mitting station. This is necessary in limited and it was found impossible order that the receiving aerial may pick up the wave trains. The instrument for detecting the presence of the waves is called a coherer. The earliest form consisted of a glass tube containing iron filings, the tube being fitted with iron plugs at both ends. In the presence of electric waves the filings tend to cling together, and thus the resistance to a current through the coherer is less in the presence of electric waves than in their absence. Hence, if a battery is attached, the current which will flow when the filings cohere together may be suffi-cient to ring a bell, say, whereas when the filings do not cohere the battery would not be able to send a the large amount of damping in the current strong enough to do so. The waves. This was soon displaced by only disadvantage to this form of the 'coupled system.' In this we coherer is the fact that the filings have two separate o cillatory circuits remain clinging together after the tuned to the same frequency. The waves which caused them to do so aerial in Fig. 4 is marked A, the have ceased, and thus renders the

coherer incapable of detecting further from which the waves are being re-This difficulty is groups of waves. groups of waves. This difficulty is surmounted by a tapping arrangement which taps the coherer and so decoheres the filings. The coherer of this type, which is used at the present time, consists of a glass tube exhausted of air and plugged by two silver plugs, the filings consisting of a mixture of silver and nickel.



represents a modern type of coherer, S and S representing the silver plugs, the filings, represented by dots, being placed in the space between them. A simple form of receiver is given in Fig. 7. A represents the acrial, C the condenser, Co the coherer, and T a transformer; the coherer circuit being tuned to that of the acrial. A far more reliable and sensitive detector is Marconi's magnetic detec-tor, which consists of a band of soft iron moving continuously under

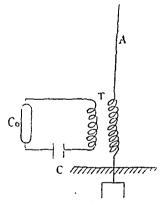


FIG. 7

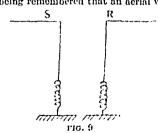
the poles of a pair of horse-shoe magnets. Just above the magnets the wire is made to pass through two small coils, the outer of which is connected to a telephone receiver and the inner to the nerial, so that oscillating currents pass through it. Every wave train then causes a 'click' in the telephone. These clicks combine to form a sound which is interrupted in at the present time. Marcon had the the same way as the wave train, and foundations for all the practical workthus the 'longs' and 'shorts' of the lings of W. T., the other systems Morse Code are easily detected, simply involving other methods in Several other forms of detectors are in use, such as the crystal detector, The perception of the direction

ceived is an important point. coni showed that if the sending acrial is bent so that there is first a vertical portion and then the remainder parallel to the ground, then the waves radiate most strongly in the direction away from which the wire is bent. Fig. 8 shows an aerial bent in this



FIG. 8

manner. Similarly the receiving aerial messages come in most strongly when the wire points away from the sender, hence the best condition for the communication between two stations is that the aerials point as in Fig. 9, 8 being the sending station and R the receiving station. For secrecy communication, the method of tuning is employed, and as the wave lengthcan be varied, so the aerials can be tuned to some secret wave length, it being remembered that an aerial will



only pick up those wave lengths to which it is tuned. Various systems besides the Marconi are in operation The late-t

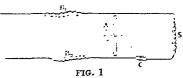
was estabe the Gold. of about 4000 m. The system differs graph system; but most of the early essentially from the Marconi system ones failed because of the very low fre-

Telegraphy. Wireless Telephony. This implies the transmission of sound through space without the use of connecting wires. A brief explanation as to the nature of sound is necessary to a satisfactory understanding of wireless telephony. Sound consists of trains of vibrations in the air. These vibrations are are an are an are an are a caused by some vibrations are a related by some vibrating object, e.g. A represents the arc lamp supplied by a violin string, the vocal chords in the current coming in by the wire B, speaking, etc. When they fall on the and leaving by B₁. The arc lamp drum of the ear they give rise to the produces oscillations in the circuit sensation of sound. In telephony of ACS. B₁, B₂ are two choking coils to any kind the function of the trans-choke any return current, C a condensition to willow they with the contractions. sounds of different quality or timbre that the difficulties of telephony Timbre, e.g. the differcommence. ence between the sounds emitted by a violin and a flute, depends on the smoothness of the variations of pre-sure in the air vibrations. In telephony the changes in the current must correspond to these changes of air pressure in every detail. If this does not take place, the quality of the sound transmitted will be lacking and will become more or less inarticulate. In wireless telephony as

schmidt system. Messages were telegraphy by Marconi gave a new transmitted in daylight between impetus to the development of the Hanover in Germany and Tuckerton, subject. Several inventions were Atlantic City, in the U.S.A., a distance taken out based on the Marconi telegraphy system aloue about in the Marconi system in the method of generating the energy and its reception at a distant station. A high frequency alternator is employed, which allows the energy to radiate from the aerial in the form of undamped waves. The receiver consists of a tone wheel which gives the signal as a clear musical tone. This system appears to be a great improvement on the Marconi system.

The following books may be consulted: Fleming, The Principles of Electric Wate Telegraphy and Telegraphy: Fleming, Heming, The Wireless Telegraphy: Fleming, The Wonders of Wireless Telegraphy.

Wireless Telegraphy: This implies to the production of electric impulses at a much greater frequency. It has been pointed out that one method employed in the production of alternating currents of high frequency is by utilising a high frequency alternator (see Dynamo) as done by Fessenden. Another method introduced by Duddell and used in several systems. E.g. Poulsen system. Fig. 1 represents the Duddell 'are' system. Fig. 1 represents the Duddell 'are' system.



mitter is to utilise these vibrations ser to prevent any current from the and to produce changes in an elector are supply entering into the second-tric current, the changes of current ary coil S, the frequency of the altercausing the sounds to be reproduced nating current in the circuit ACS in the distant receiver. How this is being controlled by the dimensions of realised is explained under Tele-C and the inductance of the circuit. PHONY. It is in the transmission of The above are the two chief methods of producing the alternating current required; the 'arc' system being used to the greatest extent. By suitably cooling one of the electrodes and enclosing the lamp in an enve-lope of gas, e.g. ordinary lighting gas, it is estimated that about five hun-dred thousand oscillations are made per second.

Transmitting apparatus.-The apparatu- for converting sound waves into electric waves consists in the primary stages of the ordinary wire telephone transmitter, i.e. the microon the field of the freeze telephony as phone transmitter, i.e. the filler now practised the process is practi-phone (see Microphone, and Trile-cally the same as in wire telephone, phony). Reference may here be The first wireless telephone invented made to the microphone invented by Bell was the photophone (q.v.), by Professor Majorana, which differs This employed a flickering beam of essentially from Hughes's microphone, light the flickering being contracted. light, the flickering being controlled This microphone has been used by by the speaker's voice. This had Majorana in his wireless telephony several disadvantages, and so did not experiments, the results obtained attain very much commercial imporshowing its efficiency. It consists of The introduction of wireless a fine jet of conducting liquid which

· of

falls between the platinum plates. varying current is superimposed on These plates are fixed in the trans-the alternating current in the circuit mitting circuit, the nozzle of the jet CAS, being fixed to a membrane on which ing th the sound waves fall. The sound mer S: vibrations cause the jet to vary in then sent out as in wireless telegraphy. thickness and thus alters the resistance of the film of liquid between the plates, which results in a variation of the current passing from one plate to the other. In order to transmit sounds it is necessary to adopt a method of varying the average

duced in the receiver is exactly proportional to the varying air pressure of the sound waves incident on the transmitter. Clearly in telephony we are concerned with the energy of a complete wave and not with the nctual current at a particular mo-ment. To effect this variation in the alternating current two methods may be employed: (1) By means of the microphone as in wire telegraphy,

me rig. 2

in this connection. The alternating current is set up by the Duddell 'are' system which has been explained pre-

The a transformer, and the battery B. was to employ a long horizontal wite. Another transformer, S. con-ists of supported on posts and earth-contwo coils, one placed in the circuit nected at both ends; being connected CAS, and the other in the nerial or at one end to a microphone and antenna.

Another method is to employ the microphone to vary the strength of the alternating current itself. senden employed this method by connecting one terminal of the high frequency alternator to the earth and the other terminal to the microphene. The microphone is then connected directly to the aerial, thus effecting a control of the radiation according to the sound waves incident on it.

Receiving instruments, -The method receiving the electro-magnetic waves depends, as in wireless telegraphy, on the principle of resonance. As in telegraphy, several stations can be worked simultaneously in the same vicinity without interfering with one another, and by suitably electing the rate of alternation of the transmitting current any station can be put into communication with any other. Yet it would be impossible to locate a large number of stations such as would be required in a populous district, and thus there is little likelihood of the wire system being displaced. In the receiving station a detector of electro-magnetic waves is required. These take various forms, the simplest type being the crystal detector. consists of a sharp point of some hard crystal, e.g. carborundum, which presses against the surface of some metal. The wayes falling on this detector heat the fine point, and thus if a circuit is made containing the detector, a direct current is generated. This follows from the well-known -elec-

मध्यो in telephony is the electrolytic detector. Usually it consists of a very fine platinum wire, one end of which projects from the end of a glass tube. system which has been explained pre-viously. B, and B, are choking colls. The point is immersed in an roid a the are, and C the condenser, the solution, the platinum and the A the arc, and C the condenser, the solution, the platinum and the worl Several other dehe ceiving circuits. microphone at, the primary co., Sn tectors have been introduced more or which has the same number of turns less suitable for the reproduction of as the secondary coll Sn in the circuit speech. The carllest method for send-CAS, the two colls forming together, ing out the waves and receiving them One end of the antenna is a battery. At the receiving station a fixed in the earth as at E, the other similar wire was placed parallel to the being a free end in the air. By transmitting wire, connected to the speaking into the microphone a vary-ground through a telephone receiver. ing current corresponding to the in-Sound was transmitted by this means, cident sound waves on the micro-, but the method is very limited in its phone is set up in its circuit; this scope. Modern telephony utili-c-only

one earth connection, the other end being elevated above the ground. The best type of aerial or antenna, as this elevated wire is termed, is fan-shaped. Its advantages consist of a small inductance, large capacity, and a very low resistance, which are of immense importance in the radiation of energy in the case of alternating currents. See Ernest Ruhmer, Wireless Telesee Efficie Ruinier, Wittess Telephony; Erskine Murray, Wireless Telephones; C. R. Gibson, Wireless Teleprophy, and Telephony without Wires. See also Telephony, and WIRELESS TELEGRAPHY.

Wiring, Electric, see ELECTRI LIGHTING AND WIRING OF HOUSES. ELECTRIC

Wirksworth, a market tn., Derbyshire, England, 14 m. N.N.W. of Derby; has lead mines, stone quarries, and manufactures of tape, hosiery, silk, and hats. St. Mary's Church dates from the 13th century. Pop. (1911) 3888.

Wisbech, a municipal bor., market tn., and river port, Cambridgeshire, England, on the R. Nen, 21 m. E.N.E. of Peterborough, in the centre of an agricultural and fruit-growing district: has manufactures of agricul-

tural implements, beer, and oil-cake. Pop. (1911) 10,828.

Wisby (Visby), a scaport of Sweden, cap. of Gotland län, on the W. coast of Wisby Is. in the Baltic. St. Mary's Cathedral was founded about 1190-1225, and is still used. St. Nicholas is nearly as old, but in ruins. W. was an important member of the Hanseatic League, and gave its name to a maritime code of the 13th century. Its rulned turreted walls date from the 13th century. It is a bishop's seat and a favourite resort. Sugar, chalk, and cement are among its exports. Pop. about 8380.

Wischau, a tu., Moravia, Austria, on the Hauna, 19 m. E. by N. of Brünn. Pop. (1911) 6220.

Wisconsin: 1. (Often called the BadgerState.) One of the north-central states of the U.S.A., and is twentyfirst in size of the republic. It is bounded on the N. by Michigan and Lake Superior, E. by Lake Michigan, S. by Hlinois, W. by Minnesota and Iowa. The greatest length is 300 m., the greatest width 250 m., and the total area about 56,040 sq. m. It is watered by numerous rivers, notably the Mississippi, St. Croix, Menomonee, Montreal, St. Louis, and the Wisconsin. The principal sheet of water is Lake Winnibago, which is 30 m. long, and around the Kettle Moraine are clustered hundreds of small lakes.

subject to extremes, and in winter is very severe. The air is dry and tornadoes are of frequent occurrence. Agriculture is the greatest industry, and the chief crops are Indian corn, hay, and wheat. Tobacco of excellent quality is grown successfully, and beet-sugar factories flourish. fisheries are important. Milwaukee is a large port and a great manufacturing centre. The system of education is especially good, and the state university has attained unite

sportation is avs feed the was hindered

by continual wars with Indians, and the first white man to enter the state was Jean Nicolet, who came there in 1634. During the Civil War W. sup-plied some of the best regiments in the Northern army. The growth of the population is steady, and in 1910 it was about 2,334,000. 2. The chief riv. of the interior of Wisconsin, U.S.A., rising in Lake Desert on the Michigan boundary, and flowing S. and S.W. past Portage City to join the Mississippi near Prairie du Chien. A canal connects it with Fox River and Lake Michigan. Length about 600 m., navigable to Portage. There are rapids and falls in parts.

Wisdom, Book of, see Ecclesias-

TICUS, PROVERBS, SOLOMON.
Wiseman, Richard (c. 1622-76), an
English surgeon. Joining the Royalist forces (1643), he was taken prisoner at Worcester (1651). W. became surgeon to Charles II, on the Restoration. He was one of the first really great surgeons, and helped to raise his pro-fession to a position of honour. See Asclepiad, iii. 231 (1886); Longmore,

Asciepiad, iii. 231 (1886); Longmore, Biog. Study . . . (1891). Wishart, George (c. 1513-46), a Scottish Protestant martyr and reformer, a member of the Wishart family of Pittarrow, Forfarshire. He was early accused of heresy, at Montrose (1538) and Bristol (1539), and then travelled abroad in Switzerland and Germany. He was at Corpus Christi College, Cambridge (c. 1542-43), and returned to Scotland (1543), preaching Lutheran doctrines on a tour through the Lothians. He found ardent supporters at Dundec, Montrose, and elsewhere, his most famous disciple being John Knox. Through the enmity of Cardinal Beaton, W. was arrested at Ormiston (1545) and burnt at St. Andrews on a charge of heresy (1546). The cardinal was assassinated soon afterwards, partly clustered hundreds of small lakes, in revenge for this. W's translation The forest growth is dense save in the of The Confession of Faith of the S., which is prairie-land. Iron and Churches of Switzerland (1548) was copper ore are found in the N.W., printed in the Wodrow Miscellany, i. while lead occurs in the S.W. The (1846). See Laing's ed. of Knox's climate generally is temperate, but is Works, i. and vi.; Foxe, Book of Martyrs ; Marlyrs; Fleming, Marlyrs of St. Anglo-Saxon times the great national Andrews; Rogers, Life, 1876; Cra-council or parliament, consisting of mond, Truth about George Wishart, 1898; Maxwell, Old Dundee, 1891.

Wishart, George (1599-1671), Scottish divine, studied at Edinburgh and St. Andrews. Having refused to take the Covenant he was deposed from his charge at St. Andrews by the General Assembly (1639), and accom-panied Archbishop Spottiswoode to England. W. then settled at New-castle, but was several times imprisoned. He was chaplain to Montrose (1645), was with him at Philiphaugh battle, and fled with him to the Continent. W. became Bishop of Edinburgh (c. 1662). His known works include a Latin account of Montrose's campaigns (1647; English trans., 1756, 1819), and MS. sermons delivered at Newcastle, 1644.

Wishaw, a tn. of Lanarkshire, Scotland, 5 m. from Carluke. There are vast coal-mines, blast furnaces, iron, engineering, and railway wagon works.
Pop. about 20,870 (with Cambusnethan and Craigneuk).

he head of dates from a 15th cenelonged to

Alachinery, asphalt, sugar, tobacco, paper, and sail-cloth are manufactured. It has iron foundries, breweries, and important fisheries. W. belonged to Sweden (1648-1803). Pop. about Gesch, der

portant fisheries. W. belonged to Sweden (1648-1803). Pop. about 22,000. See Willgeroth, Gesch. der Stadt Wismar, part 1., 1898. Wissembourg, see Weissenburg. Wissmann, Hurmann von (1853-1905), a German African explorer. He accompanied Dr. Pogge to Africa (1880-82), and went on alone to Zanzibar. For the Belgian govern-(1880-82), and wone on a care Zanzibar. For the Belgian government he later explored the Congo region, revisiting Lubuku, founding Luluaburg and Luebo, and then taking boat down Kassai R. (1883-85). W. reached the E. coast by way of Tanganyika and Nyassa (1887), but found in his attenut to take steamers failed in his attempt to take steamers by this route to Lake Victoria (1892). As Imperial Commissioner he crushed an Arab rising in German E. Africa (1888-91), becoming governor (1895-96). His works include: Im Innern Afrikas, 1888; Meine Zueile Durch querung Aquatorial-afrikas, 1891 (Wolf's new ed. 1907); In den Wildnissen Afrikas und Asiens, Jagder-lebnisse, 1901. See Hermann von Il Yssmann, by Rulle, 1892; Perbandt, Richelmann, and Schmidt, 1906.

Witch, see Magic, Demonology, Incantation, Divination.

Witenagemot (Saxon witan, know, and gemoth, assembly), in

council or parliament, consisting of members of the royal family, the archbishops, bishops, abbots, caldermen, and king's thanes. In practice its members varied from a score to a hundred, but in theory the W. having been evolved by absorption of the lesser Ws. or folkmoots of the tribes comprising the Heptarchy, it is probable that all freemen were entitled The meetings were attend. generally held blennially different places. The de jure powers of the W. were unlimited, and it could elect the king or dethrone him for misgovernment, declare war or make treaties of peace, levy taxes, appoint and remove all the great officers of state, control most ecclesiastical matters, and deal as a Court of Final Appeal After t the Gre

cilium 1. though still as great as before in theory, began to devolve for the most part on a committee called the Curia Regis, the evolution of which body

will be found described under Cabinit. Witham: 1. A tn. of Maldon dly., Essex, England. 9 nr. from Chelms-ford, on Brain R. There are ancient earthworks round the church of St. Nicholas. Pop. about 3460. 2. A riv. rising in Rutlandshire, Engined. It flows past Grantham and Lincoln, and then S.E. past Tattershall and Boston into the Wash above Wel-

land R. Withernsea, a watering-place of the E. Riding of Yorkshire, England, on

the North Sea, 15 m. from Hull, Pop. about 1430 (with Hollym). Withnell, a par. of Chorley div., Lancashire, England, 6 m. from Blackburn, Pop. about 3350.

Witkowitz, a tn. of Mährlsch-Ostrau dist., N.E. Moravia, Austria-Hungary, 23 m. from Ratibor, with important coal and iron industries. Pop. about 19,130.

Witness, see EVIDENCE, OATH. Witness, a market in, of Oxfordshire, England, on the Windrush, 10 m. from Oxford. It is noted for blanket making (though the term W blanket is loosely applied to any raised blanket with a border wherever made), and also manufs, gloves and other woollen goods. Among its tine public buildings are a 13th century cruciform church (restored 1867), the grammar school (1683), and Blue Cont School (1723). Pop. about 3586. See History of Wilney by Giles (1852). Monk (1894).

Witt, De, see Di, Witt, Jan.
Witte, Pieter de, called Pietro
to Candido (1518-1628), an historical painter, architect, and sculptor, born

at Bruges. He studied in Italy at Florence and Rome, assisting G. Vasari in the Vatican. Maximilian, elector of Bavaria, called him to Munich, where he executed some fine Munich, where he executed some ning fresco works in the New Palace and Hofgarten galleries. His pictures in-clude: 'Christ and His Disciples at Emmaus, an 'Annunciation, a 'Last Supper,' and 'Death of St. Ursula.' See Millin, Dict. des Beaux-Arts; Rée, P. Candid, 1885.

Witten atn. of Westphalia, Prussia. on the Ruhr, 14 m. from Essen. Situated among coalfields, it has steel, iron, and glass works, and manufs, chemicals, soap, beer, etc. Pop. about 35,840. See Hassel, Wittener Ortskunde und Ortsgesetze, 1903.
Wittenberg, a tn. of Merseburg gov., Prussian Saxony, on the Elbe,

about 59 m. from Berlin. The famous university (founded 1502) was incorporated with that of Halle (1817). The Court of the Augusteum (theo-logical seminary) contains Luther's house, and that of Melanchthon is near by. Luther preached in the Stadt-kirche, and to the doors of the Schlosskirche (restored 1992) affixed his ninety-five theses against indulgences. W. possesses numerous paintings by Cranach. There are brick yards, iron foundries, breweries, dye works, manufs, of spirits, oils,

Wittstock, a tn. of Brandenburg prov., Prussia, on the Dosse, 60 m. from Berlin. The textile industry flourishes. W. contains an ancient town-hall and interesting churches, and was the residence of the Bishop of Marches. Havelberg. The Imperialists and Saxons were defeated here by the Swedes under Bauer in 1636. Pop. about 7470.

Witu, or Vitu, a sultanate of Tanaland prov., British E. Africa Protectorate (since 1890), extending along the Indian Ocean. The capital, Witu, is 16 m. from Kipini, and its port, Mkonumbi, has a fine harbour in Manda Mary Cores begins a since harbour in Manda Mary Cores harbour in Manda Mary Cores begins a since harbour in Manda Mary Cores harbour in Manda Mary C Manda Bay. Omar became sultan in 1895, and is guided by a British resident. There are extensive rubber about 15 000.

Witwatersrand, see JOHANNESBURG-Woad, or Isatis tinctoria, a cruciferous plant, with yellow flowers and pendulous pods. It was formerly cultivated extensively for the dye, which it yields by fermentation of the leaves, and is still grown to a small extent.

Woburn: 1. A market tn. of Bedfordshire, England, 11 m. from Luton. It contains Woburn Abbey, the seat of the earls and dukes of Bedford (since 1547), on the site of a Cistercian abbey (1145), the present building dating from 1744. The abbey stands in Woburn Park, and has a valuable art collection. Some Jaco-making, art collection. Some lace-making, straw-plaiting, and agriculture are carried on. Pop. (1911) 1122. 2. A tn. of Middlesex co., Massachusetts, U.S.A., 10 m. from Boston. There are two ancient burying grounds and a public library. Manufs. include leather, pianos, sandpaper, and belt knives. Pop. (1910) 15,398. Woctin, a tn. of Austria, Moravia, with manufs. of cloth, furniture, and sugar. Pop. about 6500.

Wodehouse, John, see KIMBERLEY.

John Wodthouse, first Earl of. Woden, see Odin.

Wolfington, Margaret, known familiarly as Peg Wolfington (c. 1714-60), an Irish actress, played in Dublin from 1732-40. Her London Dublin from 1732-40. Her London début was at Covent Garden under dye works, manufs, of spirits, oils, Dublin from 1732-40. Her London woollen cloth, linen, leather, and hosiery, and fishing and gardening Rich in The Recruiting Officer (1740), industries. Pop. about 20,330.

Wittenberge, a tn. in the prov. of lived for some years with Garrick. She also acted at Drury Lane and lived for some years with Garrick. She often appeared in male chartactive industries in fishing and the in The Constant Couple. She excelled manufacture of oil. Pop. nearly in comedy as a lady of high rank 18,500. (Lady Plyant, Lady Betty Modish, Wittingau (Bohemian Trebon), a Millamant, etc.), but also acted in the of Bohemia, Austria-Hungary, tragedy. See Life by Molloy (1884), 14 m. from Budweis. Prince Schwar- Daly (privately printed, 1858); Doran, zenberg's castle (Lusnic Château) here English Stage, ii.; Taylor and Reade, contains valuable archives. Pop. Masks and Faces, 1852; Reade, P. about 5470.

Woffington (introduction by Dobson),

1899: Tate Wilkinson, Memoirs. Wöhler, Friedrich (1800-82), German chemist, born in Eschers-He was aided greatly in his heim. early studies by his father, and studied medicine at Marburg and Heidelberg, completing his chemical studies under Berzelius at Stockholm. From 1836 he was professor of chemistry in the medical faculty of Göttingen University. His discovery of cyanic acid and the preparation of urea from it was the first entry into the realm of organic chemistry. researches in conjunction with Liebig on cyanic and cyanuric acid founded the theory of isomerism: their joint work led to the discovery of the resident. There are extensive rubber benzoyl radical, another great step plantations. Pop. (mainly Swahilis) in organic chemistry. W.'s work on · another side led him to the isolation

of the elements aluminium, beryl-limportant works include Studien zur his writings are: Grundriss der Unschen Nationalliteratur (1859: Span. organischen Chemie, 1831; Grund. der organischen Chem., 1832; Praktische (Provencal, 1833) and Brazilian (Provencal, 1834) and Brazilian (Provencal, 18 Ubungen in der chem. analyse, 1854. literature See Hoffmann, in Berichte der Deut. Schriften Chem. Gesellschaft, 1882.

Woking, a market tn. of Surrey, England, 6 m. from Guildford, 4 m. from Bisley Common, the volunteers shooting headquarters since 1890. The London Necropolis Cemetery (1864) and Crematorium (1878) are at Brookwood, 3 m. distant. Near by are barracks, a home for disabled soldiers and sailors, and the Surrey county asylum. Pop. (1911) 24,808.

Wokingham, Oakingham, or Ocking-

ham, a market tn. of Berkshire, England, bordering on Forest, 7 m. from Reading. Windsor There is an ancient parish church, a Gothic town-hall (1860), and the famous 'Rose' inn, where Pope, Swift, Gay, and Arbuthnot composed the ballad of Molly Mog. Some of the almshouses date from 1451. W. was noted for bull-baitings till about 1821, and became a municipal borough in 1885. An annual fair is held. Pop. (1911) 4352.

Wolcot, John (1738-1819), wrote satires and lampoons under the pseudonym of 'Peter Pindar,' which were very popular in their day and have still a considerable historical value. There is a breadth and licence about his writing that made him superior in this field to his many contemporaries. Among his best works are the Lyric Odes to the Royal Academicians and The Lousiad. The most complete edition of his works was published in 1812.

Wolf (Canis Lupus, Linn.). Lieut. Colonel Hamilton Smith makes Lupus the first section of his first sub-genus, Chaon, of the Diurnal Canida, or Canine group furnished with a round pupil of the eye. In this section he W. (Lupus vul-

nubilus), and n states of N. canus, Smith). (Lucisus) he n W. (Lycisus itte of Mexico h). The comnis Lupus), of mis Lucaon) is

probably only a variety, is distributed throughout Europe generally and a

great part of Asia.

won, regunding (1490-1800), a Wone, Charles (1491-1823), an born in Yienna. He became librarian of the Imperial Library at Vienna (1817). His best-known poem is The of the Imperial Library at Vienna (1819) and secretary of the Academy His Remains with memoir by Russell of Sciences there (1847). His most appeared in 1825. Litton Falkiner (1796-1866), Wolf, Ferdinand

(1863). His Kleinere Schriften (Collected Papers) were edited by Stengel (1890). W.'s notes and supplement for the German trans. of Ticknor's Hist. of Spanish Lit. (1852) were published by his son, Adolf (1867). See Mussatia, Reihen-folge der Schriften F. Wolfs, 1866.

Wolf, Friedrich August (1759-1824). a German classical scholar, born at Hainrode, near Nordhausen. It was at Nordhausen, under the guidance of Hake, that he conceived the love of antiquity which never forsook him. From the same scholar he also learned to depend for his conclusions primarily upon his own study and judgment. His love of private study brought him the disfavour of Heyne and others at the University Göttingen, since it made his attendance at lectures extremely erratic. Though W. gave the best of his energies to the work of personal teaching, his literary production was great. In 1782 he published an annotated edition of Plato's Symposium, and this was the first of many editorial labours. In 1789 there appeared his Prolegomena ad Homerum, which gave a great impetus to the critical study of the Homeric poems. In April 1824 he went to France for the good of his health, and died at Marseilles.

Wolf, Hugo (1860-1903), a composer, born at Vienna. At an early ago he entered the Conservatorium, where he made the acquaintance of Gustav Mahler. His life was unevent-Gustav Manier. His life was unevent-ful, and was passed in the direct poverty. W. wrote an opera, Der Corregidor (1896), but it was a failure; and his two choral work-with orchestra, Die Christnacht and Der Fenerciller, are seldom heard; but he has achieved a great fame for the eploydd sours, which number his splendid songs, which number

almost 500.

Wolf (or Wolff), Johann Christoph von (1683-1739), a Lutheran divine. born at Wernigerode, where his father was ecclesiastical superli-tendent. He became the friend and pupil of Johann Albrecht Fabricius, and in 1703 managed to get to the University of Wittenberg. He was finally appointed professor of oriental languages at Hamburg. His principal work was his Bibliotheca Hebraica.

Wolfe, Charles (1791-1823), an Irish poet and clergyman, ordained 1817. His best-known noem is The

edited his poems in 1903. See Blackwood's Mag. (March 1826); Notes and Queries, 7th and 8th series; O'Sullivan's College Recollections (1825).

Wolfe, James (1727-59), a soldier, entered the army in 1741, and six years later saw service in Flanders. In 1757 he was quartermastergeneral of the force which Mordaunt led against Rochefort, and in the following year was given the com-mand of a brigade which was to be sent against Louisburg. He returned to England in November, and in the following year was promoted major-general and given command of the army sent up the St. Lawrence against Quebec. He was shot during the battle on the Plains of Abraham, and died in the hour of victory.

Wolfenbüttel, an ancient tn. of Brunswick duchy, Germany, on the Oker, 8 m. from Brunswick. The library, built in imitation of the Roman Pantheon (1723), where Lessing was librarian (1770-81), was transferred to a new Renaissance building (1887). (The Wolfenbidtel binding (1867). The workstanding fragments of Reimarus were edited by Lessing.) Machinery, leather, cork, and copper goods, preserves, cloth, and tobacco are manufactured. The Swedes defeated the Austrians here in the Thirty Years' War (1641). Pop. about 19,090.

Wolff, Joseph (1795-1862), a missionary, born at Bambery, educated at Berlin, Rome, and Cambridge. In carly life a Roman Catholic, in 1838 he became converted to Anglicanism. Volunteering as a missionary, he travelled widely over the Near East, his striting personalty and

ing his travels.

revival of German literature, and his Parzival (c. 1205), dealing with the quest of the Holy Grail, is considered one of the finest German productions. of the mest derman productions of the middle ages. In part it closely follows the *Perceval* of Chrétien de Troyes, but W. claims to have based his version on that of an unidentified Kiot of Provence. W. also wrote Titurel, a fragmentary introduction to the Parzival; Willehalm von Orangis (c. 1216, an epic from the French Aliscans); and lyrics, Wüchter (Tag) Lieder.

Wolf Rock, a rock about 117 ft. high, 8 m. from Land's End, Cornwall, England, with a lighthouse.

Wolf's-bane (Aconium Napellus), a common purplish blue-flowered garden plant, so called from its use as a poison for wolves.

Wolgast, a scaport of Pomerania, Prussia, on the Peene, 33 m. from Stralsund. It was ceded to Sweden (1648), and after changing hands many times became subject to Germany (1815). Steel, chemicals, tobacco, and alcohol are produced.
Pop. about 8350. See Heberlein.
Beiträge zur Gesch. der Burg und
Stadt Wolgast, 1892.

Wohlgemuth), Wolgemut (or Michael (1434-1519), \mathbf{a} German painter, chief of the early school of Franconia. His stepson Pleydenwurst assisted him in his large workshop, and together they prepared the woodcuts for the Schedelschen Weltwhould (1493-94) and Koberger's Schalzkammer . . . 1491. His works include a 'Last Judgment' at Nuremberg and 'St. Jerome' (Vienna Gallery). W. is thought to have engraved

on copper and wood. Wollaston, Thomas Hyde (1766-1828), an English natural philosopher and chemist, born at E. Dereham. He took his medical degree from College, Cambridge. Caius Not succeeding in his profession, turned his attention to chemistry, particularly in connection platinum, palladium, and rhodium, and to optical invention. He was elected F.R.S. in 1793, and secretary to the society in 1806. Apart from these activities he led a severely retired life. He received the royal medal of the society for his method of manufacturing platinum and his striking personality and per- of manufacturing platinum and suasive eloquence being responsible rendering it available for instrufor many conversions, though among ments (particularly crucibles). He the Jews his labours were less success- is noted as the inventor of the camera ful. He wrote several books describ- lucida, and the goniometer, and for the discovery of dark lines on the Wolfram, see Tungsten.
Wolfram von Eschenbach (c. 1170C1220), a poet or minnesinger of medical Germany, a native of Bavaria.
We greatest poet before the was the greatest poet before the control of Bavaria.

Wollin, an island of Pomerania, Prussia, on the Great Haff, with Usedom separating the Stettiner It is about Haff from the Baltic. 30 m. from Stettin, opposite the Oder's mouth. Wollin (pop. about 5000) on the Dievenow is the chief town. Pop. about 15.000.

Wollongong, a seaside resort of Camden co., New South Wales, Ausresort of tralia, 7 m. from Lake Illawarra, and about 47 m. from Sydney, with trade in coal. Pop. about 3500.

Wollstonecraft, Mary, see Godwin,

MARY WOLLSTONE.
Wolseley, Garnet Joseph Wolseley,
Viscount (1833-1913), a distinguished

soldier, born at Golden Bridge House, co. Dublin, of an old Staffordshire family. He was educated privately, and entered the army in 1852. A long career of active service commenced with the Burmese War of 1853, during which he was severely wounded in the left thigh. He was again wounded in the Crimea, where he served with the 90th Light Infantry. He received the cross of the Legion of Honour for bravery, and hardware and woollens. It is a civil hardware and woollens. It is a civil Legion of Honour for bravery, and became captain at the age of twentytwo. He was present at the relief of Lucknow and at other engagements Indian in the Mutiny, becoming lieut.-col, at the close of the war. commanded the Canadian Red River | tween Etruria and Longport stations. expedition of 1870, and took part in the Ashanti War of 1873, receiving the thanks of parliament and various honours on his return home. In 1882 he was raised to the peerage (created viscount, 1885). About this time he was engaged in Egypt, won the battle of Tel-el-Kebir in 1882, and commanded the expedition which attempted to relieve General Gordon in 1884-85. He became commander-in-chief in Ireland in 1890, was made field-marshal in 1894, and from 1895 till 1900 w the forces. : . Pocket-book

Focket-600k Life of the Duke of Marlborough, 1894; Decline and Fall of Napoleon, 1895; The Story of a Soldier's Life,

1903, etc.

Wolsey, Thomas (c. 1475-1530), a cardinal said to have been the son of a butcher, was educated at Magdalen College, Oxford, and took holy orders. He was presented to the living of Limington in 1500, and in the next year was appointed domestic chaplain to Henry Deane, Archbishop of Canterbury. Henry VII. made him one of his chaplains in 1507, and preferment followed preferment rapidly. He was made dean of Lincoln in 1509, canon of Windsor in 1511, dean of Hereford in 1512, and of York the next year, bishop of Lincoln in 1514, and later in the year archbishop of York. Leo X. created him a cardinal in 1515. He had now for some time been consulted by the king on tem-noral matters. He directed the plan

campaign against France in 1512, arranged the treaty of 1512 with that country, and accompanied Henry to the Field of the Cloth of Gold. was indeed virtually prime minister, and went as ambassador-extraordin-

hardware and woollens. It is a civil parish of Weardale. Pop. (1911) 3414. Wolstanton, a suburb of Stoke-

Pop. (1911) 27,335. Wolverene, see GLUTTON.

Wolverhampton (Handone, frunahamton), a municipal and parl. bor, of Staffordshire, England, 12 m. from Birmingham. It contains a free grammar school (founded 1515), a Blue Coat school (founded 1515), a school of art, and various benevolent institutions. St. Mary's Church (later the Royal Free Chapel) was founded about 996. St. Peter's Church is old in parts but was would! (1855). The in parts, but was rebuilt (1865). The capital of the 'Black Country,' W. has numerous blast furnaces, foundries, and collieries, and manufactures locks, japanned goods, hardware tools, motor cars and cycles, electrical machinery and plant, etc. Pop. (1911) 95,328.

Wolverton, a small tn. of Buckinghamshire, England, 9 m. from Buckingham, near the Ouse. It has fine railway carriage shops and printing works. It is connected by steam tramway with Stony Stratford, 2 m. distant. Pop. (1911) 7384.
Womb, see UTERUS.
Wombwell, a tn. of the W. Riding, Yorkshire, England, 4 m. from Barns-

ley, with extensive coal mines. Pop. about 13,260.

Women's Suffrage. The movement for the extension of the franchise to women, though in its militant and organised aspect an event of the present decade only, may be said to have had its intellectual origin in J. S. Mill's plea for perfect equality of the sexes in the essay entitled The Subjection of Women (1869). Mill held that 'the principle which regulates the existing social relations between the two sexes-the legal subordimation of one sex to the other-is wrong in itself, and now one of the chief and went as ambassador-extraordinary to France to conclude the peace inflammans in 1527. He sided with the king in the matter of the divorce of Catherine of Aragon, but, owing to delays in the proceedings, fell into disgrace, and was indicted in 1529, but pardoned the following year. In

laboured prior to that Act of acquir-stituency as a parliamentary electoring any property of her own. All that if he resides or is an occupier of land a woman could gain, whether hy in-heritance or otherwise, became ipso facto the property of her husband. As the law how stands women are in a position of almost absolute equality with men in respect of their pro-prietary relationships. Politically their status is yet far inferior to that of men, in spite of the fact that the municipal franchise has been extended to them, and that local offices of such dignity as mayoralties are open to them without restriction. It is not the purpose of this brief notice of the topic of W. S. to weigh or even to give the principal current arguments for and against the extension to women of the parliamentary franchise. Those arguments have been and are now so constantly reiterated from public platforms and the press of to-day that it may be assumed they are common knowledge. (The arguments against W. S. will be found well set out in Mr. Heber Hart's book, Wational Danger,

Anti-Suffranct-Anti-Suffraget-I be said here is that leading men of all shades of political opinion appear to be of one mind on the logical absurdity of denying to women the right to vote, a concensus of opinion that has been amply demonstrated by the fact that W. S. for the twenty-five years between 1886 and 1911 was never once defeated in the House of Commons. Bills on W. S. passed their second readings six times between 1886 and that stage. The debate in March 1907 on Mr. W. H. Dickinson's Bill resulted in that Bill being 'talked out.' In March 1912 the Conciliation Bill was defeated by the narrow majority of fourteen, a defeat which Mrs. Fawcett attributes with much truth to the militant tactics of the Women's Social and Political Union, the absence of twelve Labour members during the coal strike of that year, and the defection of the Irish members, who feared that the passing of the Bill would cause the Liberal government to resign and thus destroy their hopes of seeing the Home Rule Bill become law. The debate in 1913 on the amendments to the Government Franchise Bill of 1912 is the last occasion on which W. S. has been before parliament, and it must be conceded, perhaps, that an air of unreality pervaded this last debate,

which, specifically stated, turned on the resolution to omit the word 'male'

Women's Property Act, 1882, of Every male person over 21 is the disability under which a woman qualified for registration in a conlaboured prior to that Act of acquiristituency as a parliamentary elector or premises in that constituency, etc.). Whether the academic listlessness that characterised the debate was to be attributed to the pressing demands on the time of the government exacted by the Home Rule Bill and other dominant issues, or to the extraordinary outbursts of organised violence, extending to depredations on private property, of the militant section of the supporters of female suffrage, may be an open question. At all events. the loss of the amendment resulted in further violence and a series of incendiary outrages on country mansions, the consequence of which was the raiding of the headquarters of the Women's Social and Political Union by the police. This raid on the union's papers and the decision of the High Court, which held the funds of the union liable to answer damages for destruction of property by their agents, would appear to have effectually for a time burked the whole movement. Arising out of the con-tinual breach of the law by the mili-tant 'suffragettes' and the consequent wholesale imprisonment of large batches of women, parliament passed an Act, colloquially termed the 'Cat and Mouse Act,' which had for its object the rendering effective the imprisonment of women who nullified their sentences by 'hunger striking, and defying all efforts forcibly to feed them in prison. In view of the overthem in prison. In view of the over-shadowing effect of these active steps against the militancy of the suffragists, it is difficult to state pre-cisely the policy of the National Women's Social and Political Union. The election policy of the National Union of Women's Suffrage Societies is best stated in the words of is best stated in the words of Mrs. Fawcett, to support in a contested election the best friend of Women's Suffrage to whatever party he may belong. As the Labour party (particularly Mr. Lansbury) has identified itself with W. S., this means that the whole-hearted support of the N.U.W.S.S. will always be given to a Labour candidate unless some other party candidate can show strong reasons for giving the union ground to believe in the bona fides of his sup-port. See M. G. Fawcett, Women's Suffrage (People's Books), 1913. Wön-san, or Gensan (Chinese Fuan-

shan), a treaty port at the head of Broughton Bay (Port Lazareff), on the E coast of Korea, Japan. Hides, fish, and gold are exported. The the resolution to omit the word 'male' Japanese control most of the trade. in the first line of the first sub-section to clause one of the Bill (which ran, tion with Japan Shanghai, Vladivos-

Wooburn, a par. of Wycombe div., Buckinghamshire, England, 7½ m. from Windsor, with paper and mill-board mills. Pop. (1911) 4047.

Wood, in the widest sense, is all that part of a plant that exists between the with and the bark; in a

that part of a plant that CAISES of tween the pith and the bark; in a narrower sense, it is applied only to those bundles of tissue which are called woody tissue. The two great classes of plants, Exogens and Endogens, yield very different kinds of W. in consequence of the manner in which their fibres are deposited. Endogens have no bark and are generally hollow in the middle. The stems of Exogens are solid, and as the tree increases in age the W. becomes more solid. Hence a distinction is made between the centre of the W. of the trunk and its circumference, the one being called heartwood, the other sap-wood.

Wood (or a Wood), Anthony (1632-95), an antiquary, born at Oxford, and educated at Merton College. Dugdale's Antiquities of Warwickshire roused him to attempt the same task for Oxfordshire, and after six years labour I

quities o worked continui with ev t. from Edward.

Clark, L.
Hist. Soc.), 1891-97.
Wood, Ellen (better known as Mrs.
Henry Wood) (1814-87), a novelist,
contributed to the New Monthly
Magazine, in 1861, her first work of
fiction, East Lynne, which at once
established her as a popular writer. Among her numerous stories arc Mrs. Halliburton's Troubles (1862), The Channings (1866), Within the Maze (1872). The Johnny Ludlow tales were contributed in 1868 to the Argosy Magazine, of which she was proprietor and editor. Mrs. Henry Wood invented excellent plots, but her novels are without literary distinction. They had, and still have, an enormous circulation. East Lynne is the most popular, and it has several

times been successfully dramatised.
Wood, Sir Evelyn (b. 1838), a British
general, born at Cressing Vicarage,
Essox, the son of the Rev. Sir J. P. Wood. He first served in the navy, which he entered in 1852, and was with the Naval Brigade in the Crimea. Transferring his service to the army, he gained the Victoria Cross during the Indian Mutiny, and, having changed again from cavalry to inthe indian alumy, and, having to is a involute ord with sporting changed again from cavalry to in-and is much valued for the table. The fantry, he served through the Ashanti great majority occurring in Britain War with the rank of licutement- are migrants, arriving chiefly in

tock, and other ports. Pop. about colonel. The Zulu War found him in 20,000. in the Boer War of 1881. In 1883 he raised the Egyptian army, becoming its commander-in-chief, and he served in the Nile Expedition of 1894-95. From 1893-97 he was Quartermaster-General of the Forces, and from 1897-1901 he was Adjutant-General of the Forces. He commanded the Second Army Corps and Southern Command from 1901-4, and in 1903 was made a field-marshal. When the territorial force was formed he took an active part in its organisation, becoming chairman of the City of London Association. He was G.C.M.G. (1882) and G.C.B. (1897). See his autobiography, From Midshipman to Field-Marshal.

Wood, John Georgo (1827-89), a writer of natural history, born in London, educated at home and at Oxford. He took holy orders and held some minor appointments, but devoted himself chiefly to literary work. He gave many lectures in England and America, and produced a long series of popular works on zoology, among them My Feathered Friends. a 'Common Objects' series. Bees, The Natural Hist. of Man, etc.

See Life by his son.

Woodbine, a name formerly given to twining and elimbing plants, in-cluding ivy. Shakespeare used it of the honeysuckle, but it is also applied to Polygonum convolvulus.

Woodbridge, ariver-portand market tn. of Suffolk, England, at the head of the Deben's estuary, forming a sub-port of Ipswich (8 m. distant). Pop. (1911) 4623. Woodbury, Walter Bentley (1831-55) the inventor of the Woodbury.

85), the inventor of the Woodburytype process and other processes for photo-mechanical printing and photographic apparatus. He was born at Manchester, and had a scientific edu-cation. Among his intimate friends cation. Among his intimate trienus were Simpson and Pritchard, who were also photographic ploneers. See Harrison's Hist. of Photography.

Woodburytype, see Photography, Process Work.

Wood-enrying, see Carving. Woodehat, or Woodehat Shrike (Lanius auriculatus), a shrike, native of Africa, which occasionally visits Britain. It is about 7 in long, and its colour is mainly black and white with a reddish head.

Woodchuck, see Marmors.
Woodcock, or Scolopax rusticula, a
game bird, which in recent years has become much more numerous in Britain, and breeds in most countles. It is a favourite bird with sportsmen

Philohela minor.
Woodford, an urban sanitary dist.
and tn. of Walthamstow div., Essex,
England, 8 m. from St. Paul's, London. Pop. about 13,800 (with Woodford St. Mary, Woodford Green).
Woodford Wells, Woodford Green).
Wood Green, a tn. and eccles. par.
of Middlesex, England, 6½ m. from
St. Paul's, London. The Alexandra
Park and Palace are close by. Pop.

(1911) 49,369.

Woodhouse, an eccles par. of the W. Riding of Yorkshire, England, 4 m. from Sheffield. W. Mill Station

is 11 m. distant.

Woodhouse, Robert (1773-1827), an English astronomer, Lucasian professor of mathematics at Cambridge 1630), Plumian professor of astro-nomy (1822), and director of the observatory (1824). He published: Plane and Spherical Trigonometry, 1809; A Treatise on Astronomy, 1818-1810. See Knight's Penny Cyclop., 1843; Ball, Hist. of Maths. at Cam-

crustaceans of the family Oniscide. ment which collects the rents and Though they have all become adapted profits of the crown's hereditary to terrestrial life, they find damp estates, which revenues in 1760 were necessary to their existence, and transferred to the nation in exchange necessary to their existence, and transferred to the nation in exchange some species, notably *Ligia oceanica*, to a civil list allowance, which is over 1 in. long, are confined to the seashore. The food of W. is entirely vegetarian, and they are land, on the Glyme, 8 m. from Oxford. The oval body consists of a small the English kings. After Blenheim head, seven-segmented thorax, each 1704, the place was granted to the comment beginning a pair of less.

scansorial birds. The Picide are manufactured. Pop. about \$800. especially constructed for climbing up the bark of trees, and for obtaining from the crevices thereof the insects which constitute their food. In the feet, though very short, are unusually strong; the nails are broad and crooked, and the toes placed in pairs, that is, two forward and two backward. As an additional and powerful support in their ascent of the trunks of trees, their tail feathers terminately noints, and are uncommonly bridge University and founded the

October. The ability of the parent hard, so that when they are pressed birds to carry their young, pressed against the bark they assist the birds between the legs and breast, to feeding grounds, has long been established by naturalists. The W. is about 14 in. long, and its plumage is and in one species (Picus principalis) brown grey and buff with black markings. The American W. is Philohela minor.

Woodford on when sanitary dist

Wood-preserving, see TIMEER.
Wood-pulp consists of wood fibre
which has been reduced to a pulp
either mechanically, by grinding wood
under water, or chemically, by boiling small pieces of the wood with caustic soda or calcium bisulphite under pressure. The wood most generally used is poplar, and the pulp is used in the manuf, of paper (q.r.).

Woodruft, or Asperula, a genus of small plants (order Rubiaceae). The sweet W. (A. odorata) is a common perennial in woods and is often gathered and dried for its persistent

odour of new-mown hay.

Wood's Halfpence. 800 WILLIAM.

Wood-sorrel, see SORREL. Wood-spirit, see PYROXYLIC.
Woods and Forests. The

property of the crown consists partly of a number of royal forests, the chief of which is the New Forest, comprising some 50,000 acres. Formerly bridge, 1889.

Woodhouselee, see Tytler, AlexWood-lies, see Tantalus.

Wood-lies, name given to isopod crustaceans of the family Oniscide.

Though they have all become adapter.

head, seven-segmented thorax, each (1704), the place was granted to the segment bearing a pair of legs, and Duke of Marlborough, Blenheim segment bearing a pair of legs, and abdomen, the appendages of which are the respiratory organs oniscus armudillo does damage in gardens.

Wood Naphtha, see PYRONYLIC.
Wood Oil, see GURJUN BALSAM.
Woodpeckers (Picidæ), a family of ture, automobiles, and pianos are Scansorial birds. The Picidæ are especially constructed for climbing with bark of trees and for obtain-

minutein points, and are uncommonly; bridge University and founded the

Woodwardian chair of geology, Clark and Hughes, Life and Letters of

the Rev. A. Sedgwick, i. Woodwork, a term applied mainly to the various processes of decorating wood, but also to the making of artificial woods. Wood-carving is an art in itself and has elaborate tools. The simple working of patterns by means of gouges or chisels is one of the commonest forms, the patterns usually being built up of single strokes of the tool. Often the raised pattern or the intaglio may be spotted by hammering with a punch. Much imitation wood-carving done by stamping with metal moulds under great pressure. Venetian marquetry is handworked with a pen-knife, the raised portions being coloured and polished, the intaglio black filled with Parquetry is inlaid W., the patterns developed from separate pieces of wood cut to shape. Poker work or pyrography is done with a hot needle, the pattern being burnt Artificial woods are made from sawdust or shavings. A tough and strong form is prepared by adding short lengths of bruised wood fibre; this is used for the curved portions of furniture as it can be moulded to shape.

Wookey Hole, a vil. of Somerset-shire, England, about 2 m. from Wells, included in Wookey parish. The noted W. H. cavern is 2 m.

away. Pop. (parish) about 1000.
Wool, the soft, curly form of hair worn by some animals, useful to them in preventing loss of body heat, and adapted by man to the manufacture of textiles for clothing. From the biological point of view, there is no definite line to be drawn between hair and W. Hair is the general term for that outgrowth of the epidermis found in most mammals and serving as a coat, while W. comprises those fibres which have a particularly curly or wavy appearance. Thus the coats of the merino and English breeds of sheep are par excellence known as W., while the term is also applied to the fibres obtained from the llama, the perces obtained from the flama, the Peruvian sheep, the Angora goat, and, perhaps more debatably, to cashmere and camels' hair. Microscopically, W. is distinguished by the possession of a serrated structure. The core of the fibre is enclosed in numerous funnel-shaped sheaths which expellences after producing which overlap each other, producing the saw-like outline which is only perceptible under the microscope. The serrations are most numerous in the finest Ws., and it is to the exist-ence of these minute irregularities that W. owes its property of matting

See | consequently, its value as a fibre for textiles. Chemically, W. consists of carbon, hydrogen, nitrogen, oxygen, and sulphur. When burnt it gives off an odour of ammonia gas, and leaves as a residue small bead-like masses of carbon. This latter property serves distinguish it from vegetable to fibres, such as cotton, which leave no perceptible masses of carbon when burnt. The properties desired in W. manufacturing purposes for length of staple, staple being a lock or matted collection of fibres, strength and uniformity of fibre, elasticity, lustre, fineness of fibre, and freedom from impurities in the shape of dead fibres, foreign matter, etc. The weav-ing of woollen fibres appears to have been practised at a very early date. Herodotus mentions that the Babylonians were clothed in woollen tunics, and the Hellenic peoples were well versed in the art. The sheen was a domestic animal among the early Britons, and there is little doubt that they wore woollen garments, fashioned either by weaving or by beating masses of W. into feit. The Romans understood all the essentials of the W. manufacturer's craft as it is practised to-day, and they carried their knowledge into the countries conquered and settled by them. A woollen factory was established in Winchester in Roman times, and its products were known and appreclated on the continent of Europe. Throughout the middle ages, however, the chief centres of the woollen manufacture were on the continent, notably in Flanders. Efforts were made at various times to establish the industry securely in Britain. Flemish weavers were introduced into Carlisle under royal protection in the reign of William I., and a colony was afterwards founded in Pembrokeshire.

e W. grown in to Flanders, ohibited this o stimulating Elizabeth, but the export of

W. was forbidden. The constant encouragement given to woollen manufacturers led to large areas being turned into pasture land for the provision of the raw material, with the result that English industry took a bias against the more intensive forms of agriculture which has had far-reaching effects. The development of machinery and the factory system had the effect of concentrating the greater part of the industry on the northern coal fields, and the southern centres gradually dwindled or peror felting into a compact mass, and, sisted as seats for the manufacture of

tions being from Australia, New Zealand, and S. Africa. In America the woollen manufacture was not established on factory lines until the end of the 18th century. The breed of sheep recognised as the best for W. purposes is the merino. Originally a Spanish sheep, it has made its way into all quarters of the world. In 1765 it was introduced into Saxony and crossed with the best Saxon breeds. Subsequently it was introduced into other parts of Europe, and, in 1809, 4000 were imported into the United States. They were introduced into Australia at the end of the 18th cen-Australia at the end of the roll century, and the colonists set about growing W. to supply the European market. The enterprise was not at first a success, but owing to the efforts of men like Captain MacArthur the quality of the W. and facilities for commerce were much improved. When the frozen-meat trade occupied so much attention in Australia and New Zealand, the danger arose that the good qualities of the sheep as regards W. would be sacrificed to mutton. The danger has been mutton. The danger has been averted, owing mainly to improved knowledge of breeding from the scientific point of view. Good cross-band W is now exported from the bred W. is now exported from the coastal districts, while the native merino still holds its own in the interior. An attempt has been made to supplement the Australian merino strain with the Vermont, or American merino, but the heat and dryness of the climate are all against the American sheep. The merino was introduced into S. America at a later date, and was crossed with French breeds. Latterly the introduction of English breeds has had the effect of producing a good cross-bred W. The Dutch introduced the merino into S. Africa, where it has flourished with little producing a good grown believed to the merino into S. little need for cross-breeding. woollen manufacture is divided into the 'woollen' and 'worsted' trades, the general distinction being that in the latter long fibres are used. In the woollen trade not only are short fibres employed, but all kinds of remanufactured materials and by-products are used. These comprise noil, the short fibres rejected in the combing

certain specialised products. In later extraneous dirt, but as it also revears the supply of the raw material moves much of the natural grease, from Britain and Europe has been almost negligible, the chief importations being from Australia, New omitted. In shearing, the fleece should be clipped off in one continu-ous piece, the W. being rolled up and secured by a simple knot. The fleeces are then classified as regards quality as a preliminary to the work of the sorter or stapler, who divides each fleece into separate qualities, as the W. deteriorates in value from the shoulders to the tail of the animal. The operation of sorting requires a high degree of discrimination, and, it may be added, a regard for cleanli-ness, as anthrax is not uncommonly contracted through infection from the contracted through infection from the W. of diseased sheep. Whether the sheep have been washed prior to shearing or not, it is necessary to wash or 'scour' the W. before proceeding to the manufacture. This is done by agitating the W. with suitable machinery in a bath containing a mild alkali. It is then uniformly dried, usually by steam heat. The next operation is to disentangle the matted fibres of the fleece. To effect this the W. is fed into a 'Willey,' consisting of a large drum and three consisting of a large with and the small cylinders armed with spikes, in such a manner that the entangled fibres are pulled apart as they pass between the cylinders. W. is then usually 'blended.' That is, Ws. of different kinds and W. substitutes, in proportions suitable for the purpose in view, are spread in layers forming a stack, each layer being oiled as it is put down. The stack is beaten down with sticks, after which it is passed through a fearnought to ensure that the various fibres are adequately mixed. 'Scribbling' or 'carding' is an important operation by which the mass of fibres is still more perfectly mixed and rendered into a condition suitable for spinning. The carding suitable for spinning. machine consists of a series of rollers set with pins somewhat bent. The wool is taken up from the feed by the first cylinder or 'licker-in' and is stripped from that by another cylinder, or 'angle stripper,' from which it is removed by the pins of a time or index or large cylinder usually called the 'swift.' As the W. is carried forward by the swift, all fibres which do not lie closely on the cylinder are removed by 'workers,' cylinders from which the fibres are removed by still more snort fibres rejected in the combing workers, Chindres when the operation for worsteds; mungo, the shreddings of previously manufactured clothing; shoddy, the shreddings of softer materials, as blankets, of softer materials, as blankets, collections of fibre from the machines used in the warden sprocesses. Sheep's W. is issts of a number of cylinders to a point further back on the swift. It is seen, therefore, that cylinder survive to be taken off by the dibre from the machines used in the dibre from the machines used in the cylinder survive to be taken off by the cylinders with an office the cylinder survive to be taken of the cylinders with an office the cylinder survive to be taken of the cylinders with an office the cylinder survive to be taken of the cylinders with an office the cylinder survive to be taken of the cylinders with an office the cylinder survive to be tak

tinuous film of fibres. The film is 75, 1800; the pamphlet St. John divided up into narrow strips which are passed between rubbers so as to give a circular section. The sliver is now a long rod of pith-like W., with no twist, and therefore capable of being stretched to a considerable extent. The attenuation and twisting required to convert the sliver into yarn of the requisite count is performed by means of the 'spinning formed by means of the 'spinning formed,' a machine of somewhat complicated construction, though the operation is simple. For the preparation of worsted yarn, an operation known as 'combing' is necessary. This is performed by a machine which 'appointed to the woolsack.' This is performed by a machine which separates all the fibres above a cerbinal length from the mass and imparts a high degree of parallelism to them. After spinning, therefore, minister, studied at Yale, Princeton theorems of yarn presents a clearer cut theological seminary, and in Gerappearance than woollen yarn, which remains fluffy in appearance. The dent at Yale (1846-71), and was chair principles of weaving are similar to man of the American Commission for principles of weaving are similar to those employed in other textiles. any stage of the process, given the plays of the great Great tracedlans, necessary cleansing preliminaries. Certain finishing operations, as mending, scowning, tentering, etc., vary munsm and Socialism, 1880; and according to the nature of the fabric.

Political Science. . . 1877. Woollen cloths are known as tweeds, meltons, doeskins, buckskins, etc., and are characterised by softness and elasticity. Worsteds form the largest class of suit and dress materials; they make up with excellent finish, keep their shape well, but are apt to become glossy with wear. See M'Laren, Woollen and W'orsted Spinning; A. F. Barker, Textiles.

Wooler, a small tn. and health resort of Northumberland, England, on the slope of the Cheviots, 15 m. from Berwick-on-Tweed. There are

engish engraver and draughtsman; excelled as a landscape engraver. Among his plates are; 'Temple of Apollo,' after Claude (1760), R. Wilson's 'Niobe' (1761), both published by Boydell, West's 'Death of General Wolfe' (1776), 'Battle of La Hogue' (1781). W. was appointed engraver to Georgo III. (1775).

Woodman John (1720-72) an important

Woolman, John (1720-72), an American Quaker essayist and preacher; spent his life after about 1713 in preaching against slavery and espous-

plicated construction, though the portation of which was forbidden by

appointed to the woolsack.'
Woolsey, Theodoro Dwight (180180), an American educationalist. man of the American Commission for those employed in other textiles, revising the A.V. of the N.T. (1871-Dyeing may be performed at almost 81). He edited Plate's Gargias and

munism and Socialism, 1880; and Political Science 1877.
Woolsorter's Disease, see ANTHEAX.
Woolton and Much Woolton, a par, and the of Lancashire, England, 5 m. from Liverpool, of which it forms a residential suburb. Little Woolton is 11 m. from Gateacre Station.

Woolwich, formerly a separate in. of Kent (partly also in Essex, N. Woolwich) on the Thames, now included in the metropolis (S.L.), 7 m. from St. Paul's. Greenwich Lewisham bound it on the W. Greenwich and on the W. The borough (with Eltham and Plum-Modern Remains near. Pop. 1500. stead) returns one member to parliamond woollett, William (1735-85), an ment (since 1885). The famous Royal English engraver and draughtsman; Arsenal (E.), with its foundry, Assenal (E.), with its foundry, furnaces, pattern room, and labora-tory, developed from the armoury at Tower House in Woolwich Warren (established 1585). The cannon foundry was moved from Moorfields to W. (about 1716) under the direction of Andrew Schalch of Doual, Other im-portant buildings are the Royal Miliportant bundances are the royal and tary Academy (1719, present build-ing dating from 1805), the Artillery Barracks (1775), Royal Artillery Collego, Royal Military Repository, and the Rotunda. The Brook fever hospital is at Shooter's Hill, Woolpreaching against slavery and espousing the cause of negroes and Indians, and the Rotunda. The Brook fever He came to England (1772) to visit hospital is at Shooter's Hill. Wool-where. His writings include his Journal 1775 (ed. with Whitter's introduction 1871); Considerations on Various Subjects of Importance 1773; A Word of Rec chalk and tille klins and this of portance and Caution to the Rich, remains have been discovered near 1793. See his Collected Works, 1774-by. Pop. (1911) 121,376.

Woonsocket, a city of Providence matical and mechanical researches co., Rhode Is. (N.), U.S.A., on Black-were conducted with the help of C. stone R., about 15 m. from Provi-Kaltoff, and he invented a kind of dence. Centre of a group of manu-steam-engine for 'driving up water facturing villages it produces cottons, worsteds, bobbins and shuttles, indiarubber goods, and foundry products. Pop. (1910) 38,125.

Woorali, another name for curare

(q.v.).

Wooster, cap. of Wayne co., Ohio, U.S.A., on Killbuck Creek, about 50 m. from Cleveland. Agricultural machinery is manufactured. It contains the (Presbyterian) University of W. (1870), and the Ohio agricultural experiment station. There are coal, lumber, and glass industries. (1910) 6136.

(Saxon, Worcester Hivicwaraccaster): 1. A parl., co., and municipal ccusier): 1. A pari., co., and municipal bor., episcopal city, market tn., and cap. of Worcestershire, England, on the Severn, 25 m. from Birmingham. It contains an ancient cathedral, a grammar school (1541), and other notable buildings. Every three years the musical festival of the 'Three Claim' in held here (where the contains an ancient cathedral). the musical festival of the 'Three Choirs' is held here (other years at Gloucester or Hereford). The Royal Worcester Porcelain Works (1751) are noted. Worcester sauce, vinegar, chemicals, and gloves are manufactured also, and there are iron and engine works. Cromwell here defeated Charles II. (1651). Pop. (1911) 47,982. See works by Green (1796). Noaks (1849), Walcott (1866), Smith and Onslow (1883); Victoria County History. 2. A tn. and dist. of Cape Colony, S. Africa, on the Breede and Hex rivers, 60 m. from Cape Town. Much wine and brandy are produced; there are tanneries and wagon works, and thermal springs near (at Brandand thermal springs near (at Brandviei). Pop. (1911) 8000. 3. With Fitchburg, cap. of Worcester co., Massachusetts, U.S.A., 44 m. from Boston. The Blackstone, Chicopee, and other rivers afford a plentiful and other rivers abord a periodic water supply. There are fine public buildings and parks, loom and en-velope manufactories, foundries, wire works, wool and silk mills, and manufs. of tools, firearms, boots and shoes, and carpets. W. was known as 'Quinsigamond' till 1684. Pop. (1910) 145,986. See History of Worcester by Hersey (1862) and Hurd (1889).

Worcester, Edward Somerset, second Marquis of (1601-67), an English royalist, known as Lord Herbert till 1614, and as Earl of Glamorgan (1644-16). He served King Charles in (1644-46). He served king cuaries in Ireland (1644-45), but his secret negotiations with the Irish Roman Catholics miscarried, Charles refused to support him, and he was imprisoned. He lived in France from

Kaltoff, and he invented a kind of steam-engine for 'driving up water by fire,' described in his Century of the Names and Scantlings of Inventions . . . (first printed 1663). He erected water-works at Vauxhall.

Worcester, Florence of, see Florence

ENCE OF WORCESTER.

Worcester, Joseph Emerson (1784-1865), an American lexicographer, of the American editor Almanac editor of the American Amanac (1831-43). He published a Universal Gazetteer (1817), Gazetteer of U. S. (1818), edited Johnson's Dictionary (1828), and abridged Webster's American Dict. (1829). His Universal and Critical Dict. (1846) was enlarged to the great quarto illustrated Dict.
of the English Language (1860, 1881).
See Allibone, Dict. of Authors; North
American Review (Jan. 1847).

Worcester College, one of the colleges of Oxford University, in Worcester Street, founded (1714) by The site was Cookes's bequest. Cookes's bequest. The site was partly occupied as early as 1283 by Gloucester Hall (founded for Benedictine monks). In 1542 this was used as the palace of the Bishop of Oxford. The present provost (1913) is C. H. O. Daniel. See Oxford University Calendar; Clark, Colleges of Oxford. 1891: Smith (1895). Wells (1899); Headlam, Oxford and its Story, 1904. Worcestershire. a midland co. of

Worcestershire, a midland co. of England, bounded N. by Stafford-shire, S. by Gloucestershire, E. by shire, S. by Gloucestershire, E. by Warwickshire, and W. by Herefordshire. The surface varies, the S. and S.W. being hilly, while through the centre run the river valleys with the Lickey and Clent hills in the N. The principal range is that of the Cotswold Hills in the S. with Bredon Hill, while the Malvern Hills in the S.W. reach a height of 1395 ft. in Worcester The Severn is the chief Beacon. river, with its tributaries the Teme. Stour, and Avon, forming the vales of Worcester (Severn), Teme and Evesham (Avon), the most fertile part of the county. It is well wooded and contains the two ancient forests of Wyre and Malvern Chase. The county is famous for its market gardens; and hops are also grown; almost the whole county is under cultivation, rather more than half being devoted to permanent pasture; wheat and oats are the main crops, Coal is mined and ironstone, lime-stone, and salt are also found. Droitwich and Stoke Prior are noted for their brine springs. Worcester is famous for the manufacture of porcelain dating from 1751; and Kidderprisoned. He lived in France from minster for carpets, while in the 1648-52, when he was again imprisoned for a time. His mathe-Netherton, etc., included in the Black

Country, where iron-work of all kinds is carried on. Other manufactures on its authorship, which called forth are needles and fish tackle, glass, and gloves at Worcester. Canals connect Eugen Backler, 1829. the Severn with other rivers and the railway service is good. Worcester is the county town, other important towns being Bewdley (2745), Droit-wich (4146), Dudley (51,079), Eve-sham (8340), and Kidderminster (24,333). The county returns five members to parliament. The greater part of the county was at one time in the hands of the Church, and there were no less than thirteen great monastic foundations. Of these there are the ruins at Pershore and Evesham, both dating from the 8th century, Worcester Cathedral, and the priory church at Malvern also of the same date; and ruins at Halesowen, Bordesley, and Astley dating from the 13th century. The area is 427,487 acres. Pop. (1911) 526,087. See Victoria County History –Worcester.

Worde, Wynkyn (or Winkin) de, or Jan van Wynkyn, a printer, who came to England from Alsace-Lorraine, and helped Caxton from 1477, succeeding him at his printing office (1491). He lived in Fleet Street, London, from 1502, and died about 1535. He made improvements in the art of printing, especially in type-cutting, hisworks (over 400 in number) being distinguished by elegance and neatness. See E. G. Duff, Printers, Stationers, and Bookbinders of West-minster and London, 1476-1535 (1906). Wordsworth, Charles (1806-92), an

English divine, nephew of the poet, educated at Harrow and Oxford. He was famous both as an athlete and a classical scholar. As tutor at Oxford he had Manning and Gladstone among his pupils. W. was second master at Winchester (1835-46), warden of Glenalmond Episcopal College (1846-54), and bishop of St. Andrews (1852). His works include Public Appeals on Behalf of Christian Unity, 1886; Behalf of Christian Greek Primer, 1839; Shakespeare's Historical Plays, 1853. See his Annals of my Early Life, 1866-46, 1891:
Annals of my Life, 1867-56, 1893:
(edited by Hodgson); John Wordsworth, Episcopale of Charles Wordsworth, 1899.

Words worth, Christopher (1807-85). an English divine and writer, youngest son of above, educated at Win-chester and Cambridge. He was chester and Cambridge. He was headmaster at Harrow (1836-14), canon of Westminster (1844), held a living in Berkshire (1850-60), and became bishop of Lincoln (1868). Among his works are: the Bible commentary, Greck New Testament, 1856-60; Old Testament, 1861-70; Church History up to 451 A.D., 1881-83; Memorials of William Wordsworth, 1851; Inscriptiones Pompetance, 1837; Greece, 1839 (new edition, 1858): Theoritus, 1844. 53; Atemorias of the control of the

1877. In 1873-75 occurred his controversy with the Wesleyans, and the Great Coates case.' See Life by J. H. Overton and E. Wordsworth (1888). Wordsworth, Dorothy (1771-1855), an English writer, only sister of the poet. From 1795 she kept house for her brother, accompanying him and Coleridge to Germany (1798-99). She later settled with Wordsworth and his wife at Grasmere, whence they moved to Rydal Mount (1813). The poet acknowledged in beautiful lines poet acknowledged in beautiful lines how much he owed to her inspiring now much he owed to her inspiring companionship, and dedicated to her the Evening Walk (1792). Her Recollections of a Tour in Sectional (1803) were edited by Shaftpe and her Journals by Knight (1897). She never fully recovered from an attack of brain fever (1832). A Life of Dorothy Wordsworth by Edmund Lee

was published in 1886. Wordsworth, William (1770-1850). a poet, was the son of John W., an attorney of Cockermouth, Cumberland, at which place the author was born. He was sent in 1778 to the granmar school at Hawkshead, and grammar school at Hawkshead, and in 1787 went to St. John's College, Cambridge. In that year he published in the European Magazine his first poem. It was not until 1793, however, that he issued the Ecening Walk and the Descriptive Skelches. Two years later he made the acquiniterant of Coloridge and the near well. ance of Coleridge, and the men, who recognised each other's genius, comented a firm friend-hip; and through Wordsworth, Christopher (1774- Coleridge he became acquainted with 1840), an English scholar and divine, Charles Lamb and Hazlitt. In 1798 youngest brother of the poet, educated at feellow of type of the cated at the collection of the cated at the cate ucces, attention, though Southey thought sively in the same year W., with his elser Sussex (1820). His works include: Dorothy and Coleridge, went to the Ecclesiastical Biography (1810, 1839); many, and the brother and elster Christian Institutes, 1836 (selections lived at Goslar, in the Hartz district, from English divines); Who wrote and led a quiet un-ocfable life. They

and settled at Grasmere, which was W.'s home till 1813, when he removed to Rydal Mount. He nublished various poems in 1807, and in 1814 printed The Excursion. Peter Bell and The Waggoner appeared five years later. About 1813 W. was given the sinecure of distributor of stamps for the county of Westmorland, which he held until 1842, when, on his retirement, he was granted a Civil List pension. In 1843 he accepted the poet-laureateship in succession to Southey, and his Ode on the Installation of Prince Albert as Chancellor of the University of Cambridge was one of the tasks done in his official position. Among his other works are: Ecclesiastical Shetches, 1822, and Yarrow Revisited, and other poems, 1835. The Prelude, or Grouth of a Poet's Mind, was issued posthumously in 1850. His Poetical and Prose Works, together with Dorothy W.'s Journals, were edited by Professor Knight (1896). There are biographies by his nephew Christopher W., Bishop of Lincoln (1851), and by Knight (1889). W. is principally distinguished bridge was one of the tasks done in (1889). W. is principally distinguished for his love of nature, and for the simplicity of his style. His leanings towards simplicity and his dread of being artificial on the expression of his feelings sometimes led him, however, into excesses. At his best, however, he had a magnificent gift of language, and the music of his verse Beyond all cavil, he is delicious. ranks with the great English poets.

Work, in mechanics and engineering, is the effect produced in any mass by a force acting against inertia or resistance. The effect may result in strain merely or produce motion of the mass; in all actual cases the whole W. possible is distributed, only a portion of it becoming useful, a great deal being expended in overcoming friction, or as, in the case of steam and electricity, 'leaking' owing to the impossibility of controlling the thetion, or as, in the case of steam chemical works. Fop. 17,313.

and electricity, 'leaking' owing to World, a weekly sixpenny paper, the impossibility of controlling the founded in 1874 by Edmund Yates direction of the force. In mechanical and Grenville Murray. It was espe-W. a foot-pound is the unit. Thus if cially notable for the articles, critiof resistance and the distance over which it is overcome. This is so whether the motion is direct, inclined, or curved. If in the case of a force of p lies, exerting a pull, the pull be not direct but inclined at an angle of θ marilandica). to the resultant motion, the effective mintic properties.

force is p cos \theta. Power takes account

of time; it is the time rate of doing Rhine, in the grand-duchy of Hesses

W. One horse-power is the W. of Darmstadt, 9 m. from Mannheim. Its

33,000 foot-pounds done in one most notable building is the Romanminute.

returned to England the next year | doing W. It is useful to note that the energy of 1 lb, of coal being 12,000,000 foot-pounds, only about 4 per cent, is communicated to the shaft through the piston, 96 per cent. being lost. The very best steam engines use more than 1.5 lbs. of coal per hour for each than 1.3 los. of coar per hour for each horse-power given out; engines using Dowson gas consume similarly 1 lb. of coal; oil-engines, 0.9 lb. kerosene. The metric unit of W. is the kilogrammetre; in the C.G.S. system, the unit is the degree-centimetre or 1 erg. One joule (q.v.)=10,000,000 ergs=0.7373 foot-pounds; 1 erg=13,563,000 ergs about. Resilience is the W. done on a bar in producing stress, or the W. the bar will do in regaining shape when relieved from stress. In the case of an expanding gas, when p=pressure and v=volume, p= $\frac{dW}{dz}$ when W is the to the law $pr^5=c$, a constant, then dW $=Cv^{-8}: W=C+v^{-8+1}\times C/-s+1:$

> $(v^{-8}-v^{-8})C/1-8$ is expansion from v, to v Workhouse, see Poor LAWS.

whence

Workington, a municipal bor., seaport and market tn. of Cumberland. England, 34 m. from Carlisle, on the Derwent. Its industries include iron smelting, engineering, and shipbuild-

ing. Pop. 25,092.
Works and Public Buildings, Board

of, see Board. Workshops Acts, see Factory and

WORKSHOP ACTS.

 $C = \tau_1^{1} - \varepsilon \times - C/1 - \varepsilon,$

Worksop, a market tn. of Notting-hamshire, England, on the Ryton, 25 m. N.E. of Nottingham. Its parish church, which formerly belonged to an Augustinian priory, is a fine old cruciform edifice. The inhabitants are chiefly engaged in the making of malt. but there are also brass, iron, and chemical works. Pop. 17,914.

a body of 2 lb. weight changes its cisms, and gossip of Yates, the brillevel by 5 ft., the W. given out in liant editorship of the late Mr. falling, or received on rising, is 10 Labouchere, the unrivalled parliafatting, or received on rising, is to Laboutinete, the difference partial foot-pounds, neglecting friction, etc. mentary sketches of Sir (then Mr.). The W. is measured as the product H. W. Lucy, the piquant Parisian of resistance and the distance over correspondence of Grenville Murray. and the powerful political articles of T. H. S. Escott.

Worm, see SCREW. Worm Grass, or Pink Root (Spigelia arilandica). The roots have anthel-

minute. Energy is the capability of esque cathedral of SS. Peter and

Paul, dating from the 12th century, but there is also the church of Our Lady, a handsome Gothic edifice outside the town, finished in 1467, the Crown Prince of Prussia. Pop. 1216. church of St. Paul (1102-1116) which is now converted into a museum of is now converted into a musual or antiquities, the Luther monument (1868) designed by Rietschel, the hospital, and the town hall. The hospital, and the town hall. The Bischofshof, in which the German diets met, is now replaced by a modern edifice. The town is one of the oldest in the empire, and in the time of Ariovistus was a German chief's residence. It was fortified by Drusus in 14 B.C., and in the 5th century was the capital of the Burgundians. As early as 1074 it was a tree imperial city, and is now a busy river port, with important industries river port with important industries and trade. The manufs, include The manufs. include patent leather goods, machinery, wool, cloth, chicory, and slates, while many of the inhabitants are employed in the cultivation of the vine, the most famous wine being known as Liebfrauenmilch. W. is the scene of stirring events related in Das Nibelungenlied. Pop. (1910) 46,189. Worms, see Entozoa, Anthel-

MINTICS.

Wormwood (Arlemisia absinthium), a tall perennial plant (order Compositm) with silky stems and leaves and numerous small yellow flower heads. It is one of the chief ingredients from which absinthe is derived, and is used as a tonic.

Wornum, Ralph Nicholson (1812-77), an English art critic, was for many years keeper of the National Gallery. He studied painting in Dresden, Rome, Florence, Paris, and Munich, and for a time was a portrait painter, but later became a writer and lecturer on art. He was appointed keeper of the National Gallery in 1854, and did much to develop and improve (the Trafalgar Square Galleries. He wrote Life of Holbein; The Epochs of Painting; and Analysis of Ornament.

Worsborough, an urban dist. in the Riding of Yorkshire, England, gunpowder mills, collieries, and steel works. Pop. (1911) 12,750.

Worsley, an urban dist. and manufacturing tn. of Lancashire, England, 6 m. from Manchester. It has cotton 13,906.

Worsted, see WOOL.

Worth, a par. in Sussex, England, noted for its ancient church, said to be the only perfect ground plan of a Saxon church extant in England.

burg, famous as the scene of the battle cleaned and dressed with antiscuties.

Worthing, a municipal hor, and seaside resort on the English Channel. Sussex, England, with a considerable mackerel fishery. In the vicinity is Broadwater Church, a fine example of mingled Saxon and Norman ornamental architecture. Pop. (1911) 30,305.

Wotton, Sir Henry (1568-1639), an English diplomatist and poet, born in Kent. He was secretary to the Earl of Essex during Elizabeth's reign, and under James 1. was for twenty years in the diplomatic service. In 1624

he was made provost of Eton.

Wotton-under-Edge, a tn. of Gloucestershire, England, 12 m. from Strond, with an endowed gratimar school and a handsome church. Pop.

(1911) 3021.

Wounds, the ruptures of the soft structures of the body. They are usually classified as incised, punctured, contused, and lacerated. An incised W. is a clean cut, such as is made by a knife. The blood-vessels they bleed more inds. The opening being cut clean, they freely than other kinds. tends to gape on account of the retraction of the superficial structures. When ' are kept closed ally proceeds that the two surfaces soon become united by a film of lymph, which develops into connective tissue. Punctured Ws. are those produced by the thrust of a pointed instrument. They are dangerous according to their depth; a deep-scated organ may be injured or the instrument may have carried There is frequently in septic germs. little bleeding apparent, though there may be dangerous internal homorrhage. Contused Ws. are caused by blunt instruments, or by fails. There is usually very little bleeding, though the parts may be extensively bruised. W. Riding of Yorkshire, England, Owing to the injury to the small 3 m. from Barnsley. It has extensive blood vessels, healing may be progunbowder mills, collieries, and steel tracted. Lacerated Ws. are progunbowder. tracted. Lacerated was me duced by injuries from machinery, the are dangerous when extensive, as there is considerable danger of infecmanufactures, ironworking, brick-making, and coal-mining. Pop. (1911) by 'second intention'; a film of lymph forms over the W. and granulations form. A scar ultimately takes the place of the destroyed skin. If tissue has been much destroyed, extensive sloughing may take place. In treating Ws. it is necessary first to arrest the bleeding and then close the W. Where there is danger of septic Worth, a vil. of Alsace, Germany, on the Sauer, 11 m. from Weissen-infection, however, the W. should be coloned and dressed with antisentles.

Wouverman, Philip (1620-68), a Dutch painter, was born at Haarlem. Having studied under his father, Paul Wonverman and John Wynants, he pursued his art in his native town with apparently little success, although his landscapes and hunting scenes are now very much appreciated for their breadth and animation of treatment.

Wrangel, Carl Gustav (1613-76), a famous Swedish soldier. He became a major-general of infantry at the age of twenty-four, and distinguished himself at the battles of Wolfenbüttel (1641) and Leipzig (1642). He commanded the Swedish fleet against the Danes in 1644-45, and in 1646 succeeded Forstensson as commander-in-chief of the Swedish army in Ger-many, playing a prominent part in the later stages of the Thirty Years' War. He subsequently became a member of the Council of Regency, but failed as an administrator.

Wrangel, Count Friedrich Heinrich Ernst (1784-1877), a German general, born at Stettin. He distinguished himself in the campaigns of 1807 and of 1813-14, and in 1848 commanded the federal forces of Schleswig-Hol-stein against the Danes, whom he defeated at Schleswig. In 1863-64 he again took the command in the war against Denmark. He was made a

count in 1864.

Wrangel Land, New Columbia, or Long's Island, an island in the Arctic Ocean off the N.E. coast of Siberia. It was discovered by Long, although Wrangel made an expedition in search of it. It consists mainly of bare rocks which rise to a height of 2000 ft.

Wrangler, the term applied in the University of Cambridge, England, to efirstgrade

os, i.e. the urs in pure The one

who wor the first place in this grade was, until 1912, called Senior Wrangler. Those in the second grade are designated Senior Optimes, and those in the third Junior Oplimes. The name is derived from the public disputations in which candidates for honours formerly participated.

Wrath, Cape, see CAPE WRATH.
Wraxall, Sir Nathaniel William,
Bart. (1751-1831), a writer of memolrs, born in Bristol. His Historical Memoirs of my own Time, from
1772-1784 (2 vols., 1815), are of importance for the sidelights they they portance for the sidelights they throw upon the history of the later Georgian period. The continuation (1784-90)

Berlin, Dresden, Warsaw, and Vienna (2 vols., 1799). He was M.P. for Hindon from 1780, and afterwards sat for Wallingford.

Wray, John, see BAY (OR WRAY).

JOHN.

Wrecks. The law on W. is contained the Merchant Shipping Act of 1894, so far as territorial waters are concerned. In earlier times flotsam. floating wreck; jetsam, property thorwn overboard to avoid wreck; ligan, property sunk and marked with buoys for purposes of recovery; derelict, or totally abandoned property, were distinguished from wreckperty, were distinguished from wreck-age cast on the shore, and were claimed by the Admiralty on behalf of the crown. These are all now in-cluded in the one general term. Re-ceivers are appointed by the Board of Trade, which has taken over the powers of the Admiralty, and it is their business to take charge of any wreckage found or brought in. excent in the case of that brought from extra-territorial waters by a foreign ship, unless requested by the owners or other interested party. It is the duty of all persons finding wreckage to notify the receiver, who must pro-ceed to the place and take complete charge, not merely of property but of all means of recovery, including the work of persons near, vehicles, means of approach, and so on, as also of public order; he also must notify the rearest customs house, and, if the value is over £20, Lloyds. In cases where the right to wreckage has been granted by the crown to lords of the manor, or other persons, they also must be notified. The duties of receiver, if he be absent, devolves on the chief customs officer, first; then on the chief officer of the coastguard, inland revenue officer, sheriff, justice of the peace, or officer of the navy or army on full pay. The wreckage being received, is finally sold, unless claimed within a year by the owner, the proceeds being paid over to the crown or other person having the right, after the salvage claims and expenses have been deducted. These the owner, if his claim has been estab-lished. In any case also, duty is levied on goods so recovered as if it had been imported naturally. The also must be paid before recovery by receiver's duties also extend to cases of ships in distress and any services rendered; he, or a wreck commissioner appointed by the Lord Chan-cellor, holds a court of inquiry. When was published in 1836. He also W. occur in navigable water-ways or issued Cursory Remarks Made in a Tour, 1775: Memoirs of the Valois for the safety of such places have Kings, 1777; History of France from power to remove them, and claim Henry III. to Louis XIV. (3 vols. expenses from the owners or underty 1795); and Memoirs of the Courts of writers if they have entered into pos-

session. The term wreck applies only (1750), and another by Phillimore to tidal waters and to vessels and (1881). session. The term were applies on, to tidal waters and to vessels and their contents; in the U.S.A. it applies also to inland lakes and the large rivers. In proportion as ships have become larger and have discarded sails, the number of W. has largely diminished; storm warnings have added to the safety of vessels largely. On the other hand, the value of W. is generally larger and salvage may be very remunerative; companies and firms have established themselves for the sole purpose of The employment of divers may be the means adopted to recover valuable property, or the ship may be bodily raised by ropes and chains

be pumped out and rise. method adopted is to attach large iron cylinders, or caissons, which are sunk by means of water, and lift the W. when they are pumped out. Salvage operations have even extended to ancient W. of treasure ships. See Board of Trade, Instructions as to Wreck and Salvage; for salvage operations, The Engineering Maga-zine (Jan. 1900) and Cassier's Magazine (May and Aug. 1898).

Wrekin, see Shropshire. (Troglodites parvulus), a bird ranging throughout Wren Europe, Northern Africa, and Asia. It is about 4 in. long and has short rounded wings, and usually carries its tail over the back. Its plumage is rich reddish brown, it builds a large domed nest, and additional nests are often built close at hand. Its song is remarkably loud. It feeds almost entirely on insects, and therefore though not so rough as in Lancashire, deserves the protection which it has long shared with the robin. The gold hips and one shoulder must touch ground before a wrestler is vantot the warl

Wren, Si

interested in anatomy and meand and was about thirty when he devoted and was about the profession by which he became famous. After serving as assistant to Sir John Denham, he, in 1661, was appointed his suc-cessor; in 1669 as surveyor-general of very lengthy and includes the chapels of Pembroke and Emanuel Colleges, Cambridge, the Sheldonian Theatre, or Pembroke and Emanuel Colleges, Cambridge, the Sheldonian Theatre, Oxford, and St. Paul's Cathedral, dealt with above. It is not a sport. It is 1666, he was made surveyor-general and principal architect for rebuilding the whole city. He was a many-sided man, and his energy was prodigious. He is undoubtedly the greatest British architect of modern times. There is a biography by his son, Christopher church of St. Giles, built about 1470,

Wrestling affords so obvious a means of trying the bodily strength and activity of men, that it has probably formed one of the athletic exercises of almost every nation, at least of every warlike nation. It was in use among the Greeks from the earliest times, and in Homer's Iliad (xxiii. 700ff) we have a fine description of an early contest. The Greek W. contest was divided into two parts: (1) the struggle to throw your opponent; (2) the struggle on the ground. At first the wrestlers were a girdle, but in later times they wrestled naked. The body was previously rubbed with make the skin supple and to

perspiration, and was then ded with sand to give a grip. Another The loser had to be thrown three times before he was vanquished. The Roman W. was an imitation of the later forms of Greek W. Neither of these must be confused with the modern Greeo-Roman style, which is of comparatively recent invention. Throughout the middle ages, W. was a favourite sport in England among the common people, and the Lon-doners were distinguished for their skill (Matthew Paris, Hist, Ingl. anno 1222). It has now almost died out except as a professional sport. There are two distinct English games. however, which still continue in use. the rules of which are used in amateur contests. In the Cornwall or Cornwall and Devon Game, the wrestlers wear a short strong Jacket, and the pre-liminary hold is made by a catch. Originally, heavy shoes were worn and the play often became very rough.

to the warl
Wren, Sir
an architect. As a young man he was cleanest and simplest of games, and is distinguished by the fact that there is no ground play. The preliminary hold is deliberate, each wrestler passing his left arm over the right shoulder of his opponent, the right arm under he, in 1661, was appointed his successor; in 1669 as surveyor-general of behind the back. The wrester who works. The tale of his buildings is first touches the ground loses the very lengthy and includes the chapels known as Jiu-jitsu, does not bear the

to Derby in 1797. Mainly a portrait painter, he acquired eminence by his representation of the effect of artificial

licht. Wright, Thomas (1789-1875), a prison philanthropist, born at Manchester. He was by trade a foundry worker, but devoted his leisure time to the reclamation of discharged prisoners. He declined the post of prisoners. He declined the post of prisons, thinking this would lessen his influence, but accepted a public testimonial, 1852, which enabled him to give up his work at the foundry and devote all his time to the ministration of criminals. tration of criminals. He was a promoter of the reformatory at Blackley. and worked on behalf of the ragged schools of Manchester and Salford,

and the Shoeblack Brigade.

Wright, Thomas (1810-77), an antiquary, born near Ludlow. Having written for various magazines, he established himself as a man of letters in London in 1836, and the following year was elected a fellow of the Society of Antiquaries. He was one of the founders of the Camden Society, 1838, and of the British Arches 1838, and of the British Arches 1838. Archeological 1843. Association. Among his works are: Biographia Britannica Literaria, 2 vols., 1642-46; Essays on the Literature, Popular Superstitions, and History of England Supersitions, and History of England in the Middle Ages (2 vols.), 1846; England under the House of Hanover (2 vols.), 1848; History of Luddow, 1852; The Cell, the Roman, and the Sazon, 1852; History of France (3 vols.), 1856-62.

Wright William (1827-1912) an

Wright, Wilbur (1867-1912), an acronaut, born near Millville, Indiana. Being early interested in flying, he began to experiment with his brother about 1900, and three years later accomplished a flight of 260 yds., the first successful experiment of the kind with a motor-propelled eroplane. In 1905 the two brothers made a record by ffving 24) m. at a speed of 38 m. an hour, and in 1908 Wilbur established his fame by a flight of 56 m. in France. He further increased his reputation by flying 77 m. the same year, being in the air for about 21 hours. He visited Italy and England, 1909, and also set up a school at Pau, where he trained pupils, but his latter years were mainly spent in America.

Wriothesley, Henry, third Earl of Southampton (1573-1624), Slake-spear's patron, born near Midhurst. He studied at Cambridge, and at an early age became interested in litera-

is 'one of the seven wonders of ture, and from the time he joined the Wales.' There are breweries and tanneries. Pop. (1911) 60,677.

Wright, Joseph (1734-97), an artist, parare dedicated his Venus and born in Derby. He studied in London under Hudson and in Italy, returning and he was probably on terms of to Derby in 1797. Mainly a partrait is dose intimacy with the famous poets. and he was probably on terms of close intimacy with the famous poet. He was the favourite of Elizabeth and Essex, under whom he served in expeditions to Cadiz and Azores. He expeditions to Cadiz and Azores. He afterwards participated in Essex's conspiracy, and was imprisoned in the Tower, but was released by James I. (1603). He subsequently took command of a troop of English volunteers in the Netherlands, and died of fever at Bergen-on-Toom.

Wrist, or Carpus, that portion of the arm between the hand and the lower The joint is made by the arm. articulation of the ulna and radius with the carpal bones. The mobility of the joint is combined with a great degree of strength, so that dislocations and sprains are not so common as in, say, the ankle. Fracture of the lower end of the radius is known as Colles'

fracture.

Writ: 1. In the literal sense of that which is written, W. is particularly applied to the Scriptures, or books of the O.T. and N.T., and again, in Scots' law, the term is sometimes used to denote a writing, deed, or any legal instrument. 2. In English law, a W. is a precept under seal in the name of some executive officer, such as the Lord Chancellor or a judge, having jurisdiction or authority in the particular matter, and directed to some public officer such as a county sheriff or to some private person, commanding him to do something in relation to a suit or action. In this sense a W. is a legal document which in effect is the first step in legal proceedings, civil or criminal (see Summons). Some of the more important of the multifarious Ws. in English law are the W. to the county sheriff to elect a member of parliament, a W. of habeas corpus (q.v.), Ws. of mandamus (q.v.), prohibition (q.v.), and quo warranto (q.v.), Ws. of subpæna ad testificandum, and

subpæna daces tecum.
Writer's Cramp, see CRAMP.
Writers to the Signet, see SIGNET,

WRITERS TO THE.

Writing, the origin of the art of communicating ideas by significant and convenient symbols is generally traced to the Egyptian ideograms or hieroglyphics through the later hieraneroglypmics through the later hera-tic characters (c. 2500 B.C.). But so vast is the period that must have clapsed from the time of the con-ventionalised pictograms of tangible objects or abstract ideas to the time when these actual or symbolical representations had become developed into their phonetic values, and again

ning of e over

Writing to the time when the had gone beyond the alphabetic stage, that tion (see HIEROGLYPHICS). From this it is clearly impossible to do more than conjecture the period when and where the art of even primitive picto-graphic W. was established; it is posstable that the Egyptian hieroglyphics range of country in which the cuneiwere derived from some primeval form script evidently prevailed, that form of Chinese ideographs. However that may be, the excavations of Phœnician or Canaan W. was develProfessor Flinders Petrie in the Egyptian royal tombs at Abydos and sin in disin tian royal tombs at Abydos to light inscriptions with phics assigned by Egyptole 6000 B.C. But as Mr. Thorr points out (Temple Dictiona reign of Sent (4000 or 4700 B.C.). But tablets found at Nippur seem to show that W. was practised in Babylonia as . early as 5000 B.C. or even 6000 B.C. Whether the Babylonian cunciform characters were a development of Egyptian hieroglyphics is doubtful, though the code of Hammurabi which seem to suggest such evolution.

The recovery of the ancient W. of
Babylon has ever been complicated. by the fact that the W. of the earlier Babylonians, who invented the cunel form script, was markedly different from the later script of both Nineveh

and Babylon in the time of the Sar-

B.C.). So far as the authenticity of much that is recorded in the O.T. is concerned, there can be no doubt that

the most remarkable and suggestive

discovery of modern times was that of the celebrated Tel el-Amarna tablets, comprising hundreds of letters in the cunciform character, which were

excavated from the mounds of Tel el-

Amarna, the ruined site of the tem-

porary capital of Egypt at the close of the XVIII. dynasty (c. 1300 n.c.). The philological value of these tablets

is that they seem to prove that the language of Canaan was identical with

and Nebuchadnezzar

(600)

ntian empire. They were written by kings and Babylonia, Assyria, of merely conjecture necessarily takes Fractice, and Palestine, and other the place of definite statement in tributary monarchs of the Pharaohs, surmising the course of this long evoluperfectly developed and in ordinary . use for all manner of transactions and among many people of different degrees of social rank. It is possible, too, from the obviously tremendous id as in deter-

Bible) there is evidence from clay widely different sounds, and many in tablets that alphabelic signs were then which the same sound was repre-already in use; and if this evidence be reliable it is almost useless to attempt which features greatly augmented to assign anything approaching an exact date to the origin of the Egyp-tian which leads forms show that the tian (Greek 1903) Somitic. How long this cunciform states glyphic inscription is that engraved Canan is undecled, though some on a tablet, now in the Ashmolean maintain that it did not cease to be Museum at Oxford, erected to the the prevalent form of W. till the time memory of a priest who lived in the of Hezekiah (700 B.c.). The modern European alphabet is derived directly as indicated above, Professor Petrie's from the Roman, the latter in its turn discoveries are much older, while clay from a localised form of the Greek alphabet, while for years it has been almost axiomatic that the Greek alphabet was derived from the Phonicians (see Phonicia), though the origin of the Phonician or old Semitic alphabet has not been satisfacthough the code of Hammurabi torily settled. Some derive the (2000 n.c.) does contain a few instances. Phoenician or Canaan W. from the which seem to suggest such evolution. Assyrian or Babylonian cunefform script, others variously from the hieratic W. of the Egyptians and the Hittite characters. The Hittite W. Hittite characters. The Hittite W. was related to the Vannic for proto-Armenian) cunciform script and was in all probability of Cancasian origin. The fact that three of the suggested sources of Phoenician are cunciform scripts of nations, each of which in its turn conquered or drove the Phorniclans to the narrow strand of the F Mediterranean, makes it probable that their W. was originally cunciform, and such resemblance as it bears to the hierartic W. of the Expythenstrongly suggests that the latter was the source of all the cunciform scripts. If this be so-and weight is lent to the theory by reason of the semi-hiero-glyphic nature of the Old Babylonian cunciform W.—the progression from old Egyptian hieroglyphics to late language of Canaan was identical with Assyrian emerger in Assyrian to the Hebrow; historically, their value, tic and old Babylonian W, may be constituted that they reveal to us the vastness sidered as established.

the Phoenician W. when they settled in Canaan. The earliest notable extant record of Hebrew alphabetic W. is that on the Moabite stone discovered at Dibon. 25 m. E. of the Dead Sea, in 1868, and now in the Louvre. It commemorates the vic-Jehoram, King of Moab, over Jehoram, King of Israel, and the Edomites, and is believed to belong to 890 B.C. The Siloam inscription, discovered in the wall of the tunnel con-necting the Virgin's Fountain with the Pool of Siloam (Temple Dictionary of the Bible) is also in the more developed cursive style. In 1908 Mr. R. A. S. Macalister discovered a calandar inscription in excavations at Gezer, written in the same type as the Siloam and Moabite inscriptions. From these and the rolls of Aramaic papyri discovered in 1904 at Assouan. philologists have been able to construct the whole primitive Phonician alphabet of twenty-two letters, albeit in a form which had evidently gone through numerous stages of change. Coming to Greek and Latin W., the most inexpert will readily note the closest affinities between the Greek Cadmean and local Greek alphabets, and the Pelasgian and Latin alphabets on the one hand, and on the other, the Egyptian hieratic and hieroglyphic alphabets. The Greeks, as noted above, are reputed to have learned the art of W. from the Phoenicians, and the period commonly assigned to this event is variously the 9th, 8th, or 7th century B.C., ously the 9th, 8th, or 7th century B.C., while, according to the Cadmean myths. Botia was the birthplace of the Greek alphabet. Like the Semitic W., the earliest Greek W. was always from right to left, a style which was later followed by that called boustrophedon, alternately from right to left and from left to right, as the ox draws the plough (Temple Dictionary). The earliest extant Greek inscriptions appear to be those incised on the huge figure of Rameses II. at Abu Simbel on the Nile by Greek mercenaries of the Egyptian army (c. 600 B.c.). Paleographers have long ago learnt from panyri that the ancient Greeks! throughout all known periods as far back as tradition goes employed two kinds of W., the *Literary* or *Bookhand* for works of literature, and the cursive for transactions of every-day life. There is little need in this article to

and the most inexpert can readily see

The Hebrews or Israelites borrowed the Dacian waxen-tablets of the 1st and 2nd centuries A.D. The most ancient forms of Latin literary W. are: (a) The square and Rustic capitals, and (b) uncials; then later come mingled hands of uncial and minuscule letters, and half-uncial W. W. in square capitals was neat and bears the closest possible resemblance to the familiar printed capitals of to-day, but there was no distinction drawn between N and U. The only extant between N and U. The only extant specimens appear to be a few leaves of the MSS. of Virgil (4th century A.D.). W. in Rustic capitals was more straggling in appearance, but when employed for choice literary works the characters appear to have been formed with great care. The earliest of all Latin MSS, were written in Rustics and on vellum. Instances are a poem on the battle of Actium, discovered among the papyrus fragments of Herculaneum, palimpsest fragments of Cicero's orations in the Vatican Cicero's orations in the Vatican Library, the Codex Romanus, and the Codex Palatinus of Virgil, the Codex Bembinus of Terence, and a finely executed MS. of the poems of Prudentius in the National Library at Paris, while in the British Museum come of the Cottonian MSS are written in a style which imitates the Rustic W In a style which imitates the Rustie W. The Roman cursive writing, i.e. old Roman letters written at greater speed than the formal capitals or uncials, formed the common or uncificial style of W. of practically all the Latin or Roman peoples of the first three centuries of the Christian are contacted from the first three centuries of the Christian are contacted from the first three centuries of the Christian transfer and the second states of the contact of the contac era, or rather of such of them as could write at all. The charcoal and chalk wall inscriptions, discovered in the ruins of Pompeii and Herculaneum (according to Zangemeister's Corpus Inscriptionum Latinarum in the Berlin Academy) in this hand, show that it was used for poetical quotations, pasquinades, satirical remarks. love epistles, solutations, idle words, etc. (see ch. xv. of Thompson's Palacog.). These examples, however, are little better than rough scrawls, and one must turn to the more scholarly and finely executed Ws. traced with a stilus on smooth waxen tablet surfaces for the best examples of the Roman cursive hand. It is not casy to trace the later development this hand, however, as palæographers are confronted with a complete dearth of records for some centuries, and when this hand re-appears There is little need in this article to turies, and when this hand re-appears trace the early history or follow out it has degenerated into a large the development of Latin W. The straggling hand almost utterly illegalliest Latin W. was, as noted above, gible, except by a few of the most borrowed directly from local Greek, expert readers.

Interior Land. Book and stone Materials Used .- Rock and stone

the faithful resemblance of the Latin were, no doubt, the earliest materials characters of the present day to those for the reception of W., one world-of the Pompelan wall inscriptions, or famous specimen being the Rosetta

Stone (see under Hieroglyphics). In red cord, cutlery, and steel articles, Babylonia and Assyria clay tablets Pop about 137,000. were used, and cuneiform characters appear, too, on vases, bricks, and cylinders of the same mineral. Wooden tablets, tiles, potsherds, and shells were used, especially in Egypt, Egypt, Greece, and Palestine, before the time of papyrus and parchment, while the Persians, Assyrians, and Egyptians also made use of linen and leather. But practically all the masterpieces or important records of aucient literature that have come down to us were written on papyrus, the remarkable preservative qualities of the sands of Egypt and the air-tight properties of the tombs and catacombs of that Sindbad's vale of antique treasures having saved numerous documents from the decay of time. Parchment or vellum (prepared from the skins of sheep, calves, goats, asses, or ante-lopes), from its greater durability and the fact that it was much more easily obtainable than the reed from which papyrus was made, ultimately sup-planted papyrus for all literary pur-poses, though bibles of the 4th century are found written on papyrus rolls as well as in parchment codices (see MANUSCRIPTS) or hooks. Greek!

Bond, in the MSS.

raphical Society, ed. by E. A. Bond, E. M. Thompson, and G. F. Warner; Taylor, The Alphabet, 1883; Wattenbach, Das Scriftvesen im Mittelater, 1875; and Silvestre, Universal Palao-

of the province of Hu-peh. It is almost opposite Hankow, and is the port and customs centre for the fruitful countries of Germany, and whole Hankow district. Pop. about

Wuchow, a treaty port of China, on the Si-kiang, in the province of Kwang-si. It is the distributing centre between Canton, Kwang-si, and Kwei-chow, and exports sugar, various oils, hides, and anisced, the chief imports being cotton and cotton goods, woollens, and kerosene oil. Pop. about 65,000.

Wuhu, a treaty port of China, in the prov. of Ngan-hui, on an affluent of the Yangtse-k ang. It has considerable foreign trade, exporting rice, cotton, wheat, tea, furs, and feathers, and importing opium, matches, glass, and sandalwood. It is also a manufacturing town, and is noted for its gradually took shape. It has nume-

Wullenwever, Jürgeu (c. 1497-1537), a burgomaster of Lübeck, was the leader of the democratic party in that town, and exerted himself to restore the ancient prosperity of the Hanscatic League. In this end he was for a time partially successful, but the Diet of Spier vetoed all his reforms, and in October 1535 he was delivered into the hands of Duke Henry of Brunswick, who put him to death after a long-protracted trial in which torture was freely employed

to extract a confession. Wulstan, or Wulfstan, and sometimes Wolstan: 1. A monk of Winchester in the the 9th century, author of a poem, in Latin hexameters, on the Miracles of St. Swithin, which is reputed the best Latin poem of that age produced in England. 2. An Arch-bishop of York, in 1003, author of two pastoral letters and several sermons in Anglo-Saxon, the most remarkable of which is printed in Hickes's Thesaurus.

Wupper, a riv. of Prussia, trib. of

the Rhine. It rises in the Sauerland, winds N.W., then S.W., flowing past Barmen and Elberfeld, and finally enters the Rhein between Cologne and Düsseldorf. It has a course of

63 m., but is not navigable.

Würtemberg, a kingdom in the S.W. of Germany, bounded by Bavaria, Baden, and the Lake of Constance. It has an area of 7494 sq. m., and almost entirely surrounds the two principalities of Hohenzollern. For the most part it is mountainous, the wraphy.

Wroxeter, a par. of Shropshire, 6 m.

Wroxeter, a par. of Shropshire, 6 m.

Swabian Alps on the E. and the from Shrewsbury, containing remains of the Roman station Uriconium or N. along the W. border, gradually Viroconium. Pop. about 600.

Wuchang, a departmental tn. of Kingdom. The chief rivers are the China on the Yang-tse-Kiang, capital W. is one of the most themselves. agriculture is on the whole carried on upon a good system. The metals and minerals produced are copper, lead, zinc, iron, marble, mill-tone grit. freestone, quartz, precious stones, porcelain, earth sult, coal, etc. The manufactures include linen and woollen cloths, silks, hostery, carpets. leather, porcelain, carthenware, iron and steel goods. There is also a considerable trade in the national produce of the country. Pop. 2,457,574.

Würzburg, the cap, of the Bayarian circle of Lower Main, situated in a beautiful valley on the Main. It has been the seat of a bishop since 741.

Würzen, a th. in the hingular Saxony, Germany, 15½ m. from Leipziz. It has a 12th century cathedral, and manufactures of beer, machinery.

but being built without any regular permission from the Chinese govern-

notably with Champlain, they ation dramatists. The best collected speedily formed an aliance. They edition of W.'s works is that by W. C. were the traditional foes of the Sioux Ward (1893), which is printed in the (q.r.), and in their dealings with whites were always ready to side warmed Series of Old Dramatists. He English settlers in America. Very few pure-blooded Wyandolts with the most representation of W. Sworks is that by W. C. Ward (1893), which is printed in the Werliffe (spelt also Wyeliff, Wieliff, against the English settlers in America Very few pure-blooded Wyandolts with Champlain, they actively settled annual sain the Restorspeedily formed an alliance. They actively settled annual sain the Restorspeedily formed an alliance. They actively a with a speedily formed an alliance. They actively settled annual sain the Restorspeedily formed an alliance. They actively a with a speedily formed an alliance. They actively settled annual sain the Restorspeedily formed an alliance. They actively settled annual sain the Restorspeedily formed an alliance. They actively settled annual sain the Restorspeedily formed an alliance. They actively settled annual sain the Restorspeedily formed an alliance. They actively settled annual sain the Restorspeedily formed an alliance. They actively settled annual sain the Restorspeedily formed an alliance. They actively settled annual sain the Restorspeedily formed an alliance. They actively settled annual sain the Restorspeedily formed an alliance. They actively settled annual sain the Restorspeedily formed an alliance. They actively settled annual sain the Restorspeedily formed an alliance. They actively settled annual sain the Restorspeedily formed an alliance. They actively settled annual sain the Restorspeedily formed an alliance. They actively settled annual sain the Restorspeedily formed an alliance. They actively settled annual sain the Restorspeedily formed annual sain the Restorspeedily formed annual sain the Restorspeedily forme (9.r.), and in their dealings with whites were always ready to side against the English settlers in America. Very few pure-blooded Wyandots remain, the most numerous colony being that of the village of Lawred Control Contr Jeune-Lorette, near Quebec, where there are about 300 cultivators.

Wyandotte, a city in Wayne co., Slichigan, U.S.A., on Detroit R., with manufactures of alkali, rugs and furs, soda, and starch. There are also salt works and shipbuilding works. Pop.

(1910) 8287.

Wyandotte Cave, a natural formation in Crawford co., Indiana, U.S.A. containing a greater number and variety of stalactites and stalagmites than any other cave in the U.S.A.

Wyatt, Sir Matthew Digby (1829-77), an English architect and writer, born at Devizes. In 1836 he won the e-way prize of the Institute of British Architects. Studied abroad (1851); appointed secretary to Great Exhibi-tion Committee. Instanced interior of tion Committee. Designed interior of the India Office: appointed Slade professor at Cambridge, 1861. Designed many important London buildings.

Wyatt, Sir Thomas (1503-42), a courtier and poet, born at Allington Catle in Kent. He was one of the most accomplished men of his day and was held in high favour at court.

rous fine churches and a famous episcopal palace. The district produces manor at Maidstone in 1543. His much wine and fruit. Pop. 82,114.
Würzen, a tn. in the kingdom of Sarony, Germany, 151 m. from Leip are remarkable for their grace and elegance. His satires, too, are worthy of mention; but he is chiefly rememand manufactures of beer, machinery.

carpets, furniture, cigars, leather, and paper. Pop. 17,618.

Wusung: 1. A tn. of China, in the prov. of Kiangsu, 11 m. from Shanglai, at the mouth of the Wusung R. A pioneer railway was opened between Wusung and Shanghai in 1875.

He was captured and executed.

Wyborg, see Viborg. Wycherley, William (c. 1640-1716). permission from the Chinese government, was ultimately destroyed. 2. A large fiver of China, which rises in Lake in a Wood, produced in 1671, was Sutai, from which it issues as the Futhang-ho. After this it has an eastern course, and takes the name of Hwangphu, and finally flows N. past lowed by other comedies, The Gentle-Shanchai and enters the Yangtse-klanchai and enters the Stanchai and The Plain Dealer. W.'s plays are all of them ingeniously con-3. American Indians, known also as structed, the situations are amusing, Hurons. They were discovered on and the dialogue witty and sparkling, the E. shore of Lake Huron by the but they are marred by the flagrant first French explorers, with whom, indecency that damns all the Restored the charge in the state of the state of

reformer, is supposed to have been born about 1324 in the par. of Wycliffe near Richmond, in Yorkshire. He entered Queen's College at Oxford about 1549, but soon removed to Merton. Later he became master of Balliol, and it is in this position that the first definitely historical mention of him is found. At that time a contest was raging between the secular clergy and the Mendicant Orders, whose hold on the University was rapidly increasing. W. wrote vigorou-ly, but unsuccessfully against the Mendicants. In 1365 he resigned the mastership of Baliot for that of Canterbury Hall, then recently founded by Archbishop Islep, and in 1368 he exchanged his living of Fillingham for that of Ludgershall, in thearchdeaconry of Buckingham-hire. About 1375 he was pre-ented by the king to the rectory of Lutterworth in He was already well Leicester-hire. known throughout the country, though it is gradually becoming clearer that his controver-y was more academic than popular, and that the scholastic world of Oxford was the centre of his activities and the chief He was frequently employed by the audience to which he spoke. He had king in positions of trust: he went long been speaking very freely about as ambassador to Charles V. of Spain, the relations of the civil and spiritual and after having received a grant of powers, when in 1378 the Papal lands at Lambeth in 1542, he was schism caused him to direct his in-

quiries still deeper. He was vigor- by his rendering of natural pheno-ously supported by John of Gaunt, mena, though he was less successful Duke of Lancoster, but his doctrines with the human figures and animals, and teachings were unequivocally generally inserted by other artists, condemned by the clergy. The Con- Wynberg, a suburb of Cape Town, condemned by the energy. The convection of the university declared his South Africa, 146 ft. above the sea, doctrines heretical, and the archon the railway to Kimberley. White bishop of Canterbury did the same, pop. (1911) 7886. Many of his followers were tried, and; almost all recanted. W.'s influence in England was considerably over-estimated. It was far less here than in Bohemia, where John Huss took up all his ideas. Conjugate the Jac of Wucliffe. sult England in the Age of Wycliffe, by G. M. Trevelyan.

Wycombe, Chipping, or High, a municipal bor, and market tn., Bucks, England, 34 m. from London. The Wynkyn dechurch of All Saints dates from the Wynkyn de.

church of All Saints dates from the 13th century. Chair-making is the leading industry. Pop. (1911) 24,557 chronicler, was prior of the monastries in Plinlimmon, and after a course of 130 m. enters the Severn 24 m. from Chepstow. It has valuable salmon fishery, and is noted in Herefordshire for its beauty. 2 A tn. in Kent, 4 m. from Ashford. It has the South Eastern Agricultural College and a church rebuilt by Archishop Rempe in the time of Henry VI. Pop. (1911) 1411.

Wyneham, William of (1324-1401), S. Area 97,914 sq. m., 320 m. being took deacon's orders at an early age, water surface. Forms part of the

took deacon's orders at an early age, but was not ordained priest until 1362. In 1364 he became keeper of the privy of Winchester, and in 1367 he became Lord High Chancellor of England, holding office till 1371. Winchester Lord High Chancelon of Winchester Holding office till 1371. Winchester College and New College, Oxford, were founded by him, the former being finished in 1394 and the latter in 1386; he also rebuilt Winchester 1386; he also rebuilt Winchester with the control of the control o

ceedings against him were abandoned. and his temporalities were restored.

Wymondham, a market ta. of Nor-folk, England 0 m. from Norwich. The church comprises part of the priory founded at W. in 1107, and there is also an interesting old market cross. The industries include brew-

forest preserves, and produces coffee, only admitted to the Union in 1890, tea, pepper, and cardamoms. It is Pop. (1910) 145,465 also noted for its gold mines. Wyoming Valley, a crescent-shaped also noted for its gold mines.

Wyndham, George (1863-1913), an He spent his English politician, born in London, latter years at Lutterworth, where his and received his education at Lion pen was as active as ever. He died and Sandhurst. For a short time he in consequence of a paralytic stroke, served in the Coldstream Guards, and W.'s influence in England was once sow service at Suaku in 1885. He saw service at Suakm in 1885. resigned in order to enter political life, and in 1898 became Under-Secretary for War. In 1900 he was made Chief Secretary for Ireland, and two years later entered the Cabinet. He represented Dover in the Conserva-tive interest from 1889 till his death. Wynkyn de Worde, see Worde,

S. Area 97,914 sq. m., 320 m. being water surface. Forms part of the Great Plains region. Bighorn Mts. water surface. Form Great Plains region. are noted for curious hog-back ridges. The Rockies invade the S. of the state. Gaunett Peak, highest point of Wind River Range, is 13,775 ft. Yellowstone Park is situated in this state, and is noted for its marvellous scenery and geysers. Yellowstone, Bighorn, and Powder rivers flow E.; Snake R. rises in the N. It has great mineral wealth: coalfields, silver, gold. and valuable copper mines. Natural gas is also found. There is a large arrigated area, much desert land being thereby rendered fertile. There is a state university at Laramle. Principal altitudes cipal cities: Cheyenne, Lyrande, and Rock Springs. W. was first settled in the 17th century by Spaniards. John Cotter discovered Yellowstone Park there is also an interesting old market. Color also versal Yellowstone Park eross. The industries include brew in 1897. In early days there was ing and brush making. Pop. 4716. Wynand, or Wainad, a table-land of Indian tribes. There was a great the Western Ghats, British India, rush of endgrants on discovery of about 60 m. by 30 m. It has valuable gold in the early seventies. It was

asso noted for its gold mines.

Wymants, or Wijnants, Jan (c. 161579), one of the founders of the great with rich deposits of anthruchte coal;
Dutch school of landscape painting, inoted for its scenery. The massacre
born at Haarlem. Little is known of of Wyoming, the subject of Camphis life, but he acquired great fame bell's poem, took place here (1778).

sentative of what might as wen be several important remains of denoted by the two consonants ks. several important remains of But in the Greek alphabet it was works of art are now exhibited in merely a guttural aspirate, equivalent the British Museum.

Xavier, Francis, Saint (1506-52), a Xavier, Francis, Saint (1506-52), a Torrit missionary, the needy a guttural aspirate, equivalent the British Aluseum. probably to the German ch. The letter X was the last in the Roman alphabet, neither Y nor Z belonging. Spanish Jesuit missionary, 'the alphabet, neither Y nor Z belonging to it. The words in which those two lastic of Xaviero, near Sanguesa, in letters occur are not really part of the Navarre. At the University of Paris Latin language but borrowed from the Greek, as zephyrus, zona; or from the Greek, as zephyrus, zona; or from some Eastern source, as gaza. Such of the Society of Jesus (1534). He some Eastern source, as gaza. Such of the Society of Jesus (1534). He forms as lochryma, hyems, sylva, are took holy orders in 1537, and for some errors of modern editors. The Romans years preached in Rome. In 1541 he themselves wrote lacruma or lacrima, sailed for the E. Indies as a mission-hiems or rather hiemps, and silva. The arry. After having made numerous interchanges of x with other letters converts in Goa, Malacca, Travanare as follows: (1) x with c, as in the converts in Goa, Malacca, Travanare as follows: (2) x with se or I apan (1549-51), but was forbidden sk; (3) x with g, as in Latin augeo to enter China. He died at San-chian, compared with the Greek august of the converts in Goa, Malacca, Travanare as follows: (1) x with se or I apan (1549-51), but was forbidden sk; (3) x with g, as in Latin augeo to enter China. He died at San-chian, compared with mix, lished in 1631. See Life by Mary English, and mix-tus, Latin; (4) x McClean (1896).

**Xebec, a small, swift-salling vessel with square or lateen sails, formerly with the Greek bilos.

with fine Greek $\psi_{\lambda \lambda o_5}$. with square or lateen sails, formerly Xanthi, a tn. in the vilayet of Adrianople, Turkey, with important the Mediterranean. It carried three tobacco industries. Pop. 14,000.

Xanthine (2. 6. dioxypurine),

Xanthine (2. 6. dioxypurine),

Xanthine (2. 6. dioxypurine),

Xenia, cap. of Green co., Ohio,

Xenia, cap. of Green co., Ohio,

U.S.A., the seat of Wilberforce University, Pop. (1910) 8706.

Xenocrates (396-314 B.C.), a famous blood, in urine, and in tea.

Xanthine the wife of Socrates He was a discurle of Plate and suc-

Xanthippe, the wife of Socrates. Though she possessed many fine domestic virtues, she was notorious

demestic virtues, she was notorious Platonic Academy at Athens (339-for her bad temper.

Xanthippus, an Athenian general, modified the Platonic teaching by inthe father of Pericles. He was ostratised in 484 B.C., but returned to Greece at the time of Xerxes' invasion and succeeded Themistocles as commander of the fleet (479). He won a obtained by Sir W. Ramsay by the most that the strength of the fleet is the fleet of the fleet of the fleet is the fleet of mander of the fleet (479). He won a great victory against the Persians at Mycale (479).

Xanthoxylum, or Zanthoxylum, a genus of aromatic shrubs and trees (order Rutiacere). X. frazineum, the toothache tree, gives relief in tooth-

Xanthus, the most famous city of the red and blue.

Lycia, stood on the W. bank of the river of the same name. Twice in the Greek philosopher and poet, the course of its history it sustained sieges, which terminated in the red. sieges, which terminated in the selfdestruction of the inhabitants with their property, first against the Persians under Harpagus, and long after-several elegiae poems, and a poem wards against the Romans under on nature in hexameters, of which Brutus. The city was never restored fragments remain. See Bergk's after its destruction on the latter Lyrici Graci, ed. 1900.
occasion. X. was rich in temples and Xenophon (c. 435-354 B.C.), a Greek

X to an Englishman is the repre-tombs, and other monuments of a sentative of what might as well be most interesting character, and

with square or lateen sails, formerly

He was a disciple of Plato, and succeeded Speusippus as head of the Platonic Academy at Athens (339-

fractional distillation of liquid air. is present in the atmosphere to the extent of one part in twenty million. The spectrum of X. shows prominent red and blue lines in the intermittent discharge, but with the 'jar' dis-

Xenophanes (f. 540-480 B.c.), a Greek philosopher and poet, the founder of the Eleatic school of philosophy. He was born at Colophon in Ionia, but settled for some time in Elea, S. Italy, where he wrote

historian and Athenian general, was Athens to the ground, but met with a the son of Gryllus, and a friend and slight naval disaster at Artemislum, the son of Grynus, and a friend and sugar havar disaster at Archusham, disciple of Socrates, who is said to have saved his life at the battle of (480). He retreated to Asia, and was severely defeated at Salamis Delium (424). In 401 X. entered the service of the Persian prince, Cyrus

Ximines (or Jimines) do Cishere.

officers were

expedition is given in his Anabasis. He entered his soldiers into the service of Lacedæmon. In 399 X. was banished from his home, either on account of his Spartan sympathies, or because of his friendship with Socrates, who was put to death in that year. In 396 he joined the Spartan army, and fought under King Agesilaus at Coroneia (394). He was re-warded with an estate at Scillus. where he settled with his wife Philesia. After the renewal of an alliance between Athens and Sparta (371), the decree of banishment against X. was repealed, and he is said to have lived the rest of his life at Corinth. Besides the Anabasis, he wrote a life of Agesilaus; Hellenica, a history of Greece from 411 to 362; Memorabilia, Apology, Economicus, and Symposium, all of which are expositions of the teaching of Socrates; Hiero, a dialogue on tyranny; Cyro-pædia, a political romance; On Horscmanship; Hipparchicus, on the re-sponsibilities and powers of a cavalry officer; Cyncyclicus, on hunting; The Lacedamonian Constitution; The Athenian Revenues. There have been many English translations of his The properties of X-rays as regardbest known wo madeacomple

For text, see nomenon, applied to dischant (Clarendon Press, 1900). Also covering the condition of the under-

Xenotime, or Phosphate of Yttria, a

Ytterly in Sweden.

handful of Spartans.

daugh

greata a vast army, which he led across the Helicspont by means of a bridge of boats (480). Another great feat of his

was the construction of a canal lines has now demonstrated the post-through Mt. Athos. He marched bility of destroying morbid elements southwards without meeting resist- in the tissues by a measured adminis-

the Younger, who was waging war Francisco (1436-1517), a Spanish caragainst hisse Artaxerxes

Annues (or Jimnes) do Gisneros, article (1436-1517), a Spanish caragainst hisse and statesman, born at Torre-in Castile. He studied at

de Henares, Salamanca, and the battle of Cunaxa, and X., with Rome, and receiving a papal letter of nomination, took possession of the archpriesthood of Uceda, for which he was imprisoned by the archbishop of Toledo for six years. In 1480 he was appointed grand-vicar of Siguenza to Cardinal Mendoza. Two years later X. took the Franciscan vows, and became confessor to Queen Isabella in 1492. The queen appointed him archbishop of Toledo in 1495, and on her death he was appointed regent (1506) to the mad Queen Joanna. He founded the University of Alcalá de Henare-(c. 1498), organised the preparation of a new Polyglot Bible, called the Complutensian (1502-17), and did his utmost to reform monastic life. 1507 he became a cardinal, and in 1509 led in person an expedition against Oran in Africa. On the death of Ferdinand he again neted as regent (1516-17), and died at Roa on his way to welcome the new king. Charles. See Gomez de Castro's Dr. Rebus Gestis Francisci Ximenii (1569), and Lives by Barrett (1813) and

Ulrich (1883). Xisuthros, see Deluge.

Xochimilco, a tn. of Mexico, 12 m. S.S.E. of the capital, with Aztec remains. Pop. 11,000.

X-Rays, see VACUUM TUMES.

X-Rays in Medicino and Surgery.

by different substancei early period in the study

chant (Carendon Frees, 1997). Asset to the late of the body. Thus Consult J. B. Bury's Ancient Greek lying structures of the body. Thus Historians, 1909.

an X-ray photograph may disclose a constant of the late fracture, a dislocation, a foreign body mineral which crystallises in the such as a bullet, a tumour, calculus, tetragonal system, and is found at sete. The opacity of bismuth saits to the rays has led to their utilisation in Xeres, sec Jerez de La Frontera.

Xerxes, King of Persia (485-465 canal. Thus, if a dose of bismuth be B.C.), born about 519 B.C., was the son of digestive truct and the existence of any obstruction demonstrated. The and with this end in view he organised action of the rays on certain tissues has led to many therapeutleal applications. Originating in injuries to X-ray workers, research on these ance until he reached Thermopyle, trailon of the rays. An Important where he defeated Leonidas and his adjunct to the practice is the con-He burnt trivance known as Sabourand's pastilles. These consist of platino- Xyloidine, an explosive like gun-cyanide of barium, which changes cotton, which is prepared by the colour when a certain 'dose' of X-rays has been administered. this way such conditions as rodent ulcer, ringworm, strumous glands in the neck, uterine fibroids, and other growths are cured or ameliorated.

Xylol, the commercial name given to xylene, which is obtained from coal-tar. Xylene, or dimethyl-benzene, C₄H₄(CH₃), exists in orthor, meta-, and para-modifications, and the three are similar in physical properties (boiling point 138°-143° C.).

action of nitric acid on starch or woody fibre.

Xvlonite, see CELLULOID.

· Xvlophagidæ, a family of flies which suck the juices of plants and the san of trees.

X Y Z Correspondence. President Adams of the U.S.A. used this term

Y has found its way into the alphatets of W. Europe through the later varying rigs raced without systematic Latin alphabet. The sound of y, so familiar to the English at the beginning of words, as in yes, young, yoke, racing, the tendency towards building was represented in Latin by a mere i, ships with a direct view to racing led which, however, when so used, reto the establishment of rules for decived from the grammarians the distributions hardings hardings hardings. tinctive name of i consonans. u begins a word, as union, unity, usesound of a y was commonly represented by an e before a or o, and by an i before e or u, in which cases the allied languages of Iceland, Denmark, and Sweden for the most part employ

Yablonoi, or Yablonovoi, a range of mountains in S.E. Siberia, between Transbaikalia and the Stanovoi Mts., nearly 1000 m. in length. Mt. Sokhondo (8050 ft.) is the highest peak.

Yacht, a steam or sailing vessel used for pleasure or racing. From early fitted up vessels for their personal use, and gradually there have evolved types of sailing vessels and of steam-

ceived from the grammarians the dis-termining handicaps. The most pro-Our minent of British vachting clubs tinctive name of *i consonans*. Our minent of British yachting clubs modern editors have for the most started as the Yacht Club in 1812, part substituted for it a *j*. Thus, became the Royal Yacht Club in *iugum*, or rather iveryt, which is now; 1820, and has been styled the Royal written *jugum*, commenced with a Yacht Squadron since 1833. In 1875 sound which is commonly held to the Yacht Racing Association was have been the same with our initial *y* established to govern the conditions in *yole*. The English have a habit of tracing. The original method of expressing the sound, though they do handicapping was based on tonnage not write the letter, whenever a long only, a quantity arrived at by multiput begins a word, as union, union, use pring the length by the square of plying the length by the square of ful: so that those who write an useful the breadth. It was found that this contrivance insert a letter at the end of condition favoured the building of the first word which no one would long narrow vessels with heavy keels. pronounce. In Anglo-Saxon the These vessels, however, were not very These vessels, however, were not very successful in racing foreign Ys. when the British style of handicapping was not adopted. A new rule in 1887 determined the rating by the factors of length and sail area. The length being measured at the water-line, designers now aimed at building a dish-shaped vessel with a large amount of overhang at stem and stern, and rendered stable by a heavy keel, which de-veloped later into a long fin weighted at the extremity with a heavy mass of lead. Later rules have brought times men of exceptional wealth have more factors into the rating, and the present international rule, accepted by all important countries except the U.S.A., arrives at the rating by dividing by 2 the length + breadth + 1 girth + 3 times the difference beships of small or moderate size, dividing by 2 the length + breadth + furnished with gear to a certain 1 girth + 3 times the difference bedegree of luxuriousness compatible tween the maximum chain girth and with efficient handling, and capable the real girth + 5 of the square root of more than average speed. In the of the sail area - freeboard. In case of sailing Ys., the various struc-racing, Ys. are given a time-allow-tures adopted have been determined ance for every metre of their rating by the exigencies of the rules con-according to class, and this allowance trolling racing. Before the 19th cen- is adjusted to its actual time, all Ys.

being presumed to start when the and skins. starting gun is fired. The starting line is an imaginary one drawn between two shore marks, or a buoy and l a mark. Five minutes after the A mark. Five minutes after the on the W., the provinces of Irkutsk, warning flag a gun is fired, when the Ys. begin to manœuvre for position. Primorskayn or the Maritime province on the E., and the Arctic Ocean until the starting gun is fired five minutes later, or, if it is crossed, the third of Siberia, having an area of the M. It occupies nearly one minutes later, or, if it is crossed, the starting gun is fired five. The sailing rules are very densely wooded plateau, in which stringent, and skilled judgment on the part of the helmsmen is as essential a factor in the success of a Y. as its sailing properties. Ice Ys. are contrivances, cutter or yawl rigned, with the keel replaced by runners for by means of a movable runner at the stern. Land Ys. are fitted on wheels, and rigged in the same manner as sea Ys. They are usually of small size, and are adapted for sailing on a long stretch of level beach, where they

attain a high speed.
Yajñavalkya, a Hindu sage who lived about the middle of the fourth century. He was responsible for a code of laws which is not dissimilar to the laws of Maner, and is re-garded by the Hindus as one of their

sacred books.

Yak, Grunting Ox, or Poephagus Grunniens, a large Tibetan ox, which exists both in the wild and domesticated state. Two of its chief characteristics are the fringe of long pendulous hair along each flank and the huge whisk of hair at the end of In summer the coat is a the tail. deep rich brown; the horns are black, aree and strong. The distinction arge and strong. The distinction between wild and domesticated Ys. is the grey hair on the nostrils of large sum of money; was originally the former. They can live at very light altitudes, and the domesticated animal is used as a beast of burden from thence to New Haven in 1717, and yields milk and meat.

and yields milk and meat.
Yakoba, or Yakubu, a tn. of N.
Nigeria, Africa. 140 m. S.E. of
Kano. Manufactures cotton. Pop.

50,000.

Yakub Beg (1820-77), Sultan of Kashgar. He defended Tashkent against the Russians in 1864. During the insurrection of the Doungans against the Chinese he made himself master of Chinese Turkestan. He was defeated by the Chinese in 1876 and assassinated by a servant.

Yakuts, the people who inhabit the province of Yakutsk, in Siberia. They are a northern branch of the Turkish race who came into Siberia about the beginning of the 14th century. The

They number about 300,000 and are nominally Christian. Yakutsk, or Jakutsk: 1. A farge prov. in E. Siberia, having Yeniseish on the W., the provinces of Irkutsk, abound wild beasts of great commercial value on account of their fur. Chair value on account of their fur. The most important rivers are the Lena and its affluents, the Olenek, Yana, and Indighirka. The climate in the N. reaches the extremes of cold, but in the S. crops of wheat, barley, etc. are raised. Gold, silver, copper, and other minerals are found. Page and other minerals are found. Pop. 322,600. 2. The cap, of the above prov., situated on the R. Lena. It was established as a Cossack station in 1632. It is the sent of the governor, and has a stone cathedral. a monastery, hospital, and several schools. It is the centre for N. and E. Siberian trade in furs and fossil ivory.

Pop. 8209. Yale, Elihu (1668-1721), a patron of Yale University. He was born at New Haven, Connecticut, entered the serviceo St. and

Georg cave £800 school at New Haven, and afterwards the whole university was called after

him.

Yalo University, so named in honour of Elihu Yale, Governor of Madras, who helped considerably in its endowment, besides leaving it a ture sanctioned its present name. There are various faculties and schools, besides a handsome library containing about 900,000 volumes. university is now attended by about 3500 students.

Yalta, a watering-place and scaport of the Crimea, Russia, in Taurida gov. Pop. 15,000.

Yalu, a riv, which forms a houndary line between Korea and Manchuria. It rises in Palktu-Ean, and after a course of 300 m. empties itself into Korea Bay, near Wi-ju. It is navigable for small rafts for 145 m. It was the scene of several skirmishes during the Russo-Japanese War (1994).
Yam, the edible tuberous root of

spendin, purmany species of Dioscorca, and much suit of cont to the countries, where to the countries with Russia in fursi Some species yield tubers of energial countries.

mous size. Ys. are sometimes grown size of a rat and with webbed hind in Britain, chiefly for the ornamental seet, being aquatic in habit. value of the twining branches and

white or yellow flowers.

Yama, in Hindu mythology, the judge and ruler of the departed. He red garments, crowned, four-armed, and sitting on a buffalo. He holds a club and noose, with which the soul is drawn from the deceased's body. Y. had a twin sister, Yami, and the two were thought to represent the first human pair.

Yamagata, a tn. of Japan, 170 m. N.E. of Tokyo. Pop. 42,234.

Yanaon, a small piece of French territory in Madras, India. Area

territory in Madras, India. Area 5 sq. m. Pop. 5000.
Yanbu, or Yembo, a port of Arabia, on the Red Sea. Pop. 5000.
Yang-tse-kiang, the greatest river of China. Its source is in the Tang-la Mts. of the Kuen-lun system in Central Tibet. It originates in a number of dashing torrents which are more than 16,000 ft. above the readowal. Under the name of the Under the name of the sea-level. Kin-sha-klang, it flows in an easterly direction through the prov. of Yunnan, and turning northwards forms part of the boundary line between that prov. and Szechuen. At this stage in its course it receives the waters of the Ya-long-kiang from the N., and the Heng Nan-kwang and K'i-kiang from the S. Having a tortuous course, bending in an E.N.E. direction, it waters the provinces of Szechuen, Hupeh, Kiangsi. Hunan, Nganhwei, Kiangsu, and finally empties itself into the Yellow Sea. Its chief tributaries in China which have not already been mentioned are the Min, T'o, Kia-ling, and Han from the N., and the Wu from the S. The total length is some 3000 m., of which 1500 are navigable by native rafts. The area drained by the Yang-tse is estimated at over 650,000 sq. m. The chief towns on its banks are:
Fuebow. Ping-shiu-hien, Chung-Kiang, Hankow, Wu-chang, Nanking, and Ching-Kiang.

Yanina, sce Janina.

Yankee, a term now used in Europe for any one born in the U.S.A. During the War of Independence it was derisively applied by British soldiers to the New Englanders.

Yankee Doodle, the national air of America, was probably a British tune taken to America prior to the War of Independence. The words are by Dr. Schuckburgh, a British medical

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Yard, a measure of length, equalling 3 ft., or 36 in., being the standard of English and American measures. The original measure of length was that of a grain of barleycorn—three dried grains placed end to end making I in. The length of the arm of King Henry I. was made the length of the ulna or ell, which answers to the modern vard.

Yare, a river of Norfolk, England. which empties into the sea at Yar-

mouth. Length 50 m.

Yarkand, a walled city of Chinese Turkestan, very near the R. Yarkand, about 100 m. S.E. of Kashgar. It has many mosques, caravansaries, Mohammedan colleges and bazaars. Leather goods, silk, carpets, and felt are among its manufa., and trade is chiefly with Russia and Kashmir.

Pop. about 100,000. Yarkand Daria, a river of Chinese Turkestan, which rises in the Karakorum Mts., and after a course of some 600 m. joins the Kashgar Daria, their united waters being known as the Tarim. Yarland, or Yard Land, an old Eng-

lish measure of land, varying in dif-ferent parts of the country from 15 to 20 acres.

Yarmouth: 1. Or Great Yarmouth, a parl. and co. bor., watering-place, and port of Norfolk, England. 20 m. E. of Norwich. It has fine quays, a marine parade, and two piers. fisheries are excellent, the chief fish caught being herrings, mackerel, and white fish. Pop. (1911) caught being herrings, mackere, cod, and white fish. Pop. (1911) 55,808. 2. A small scaport off the N.W. coast of the Isle of Wight, 10 m. W. of Newport, on the mouth of the Yare. There is good yachting. Pop. 950. 3. The cap. of Yarmouth co., Nova Scotla, Canada, on the Bay of Fundy. It has shipbuilding yards, fisherica and moutes of machines. fisheries, and manufs. of machinery, boots, cotton goods, etc. Pop. (1911) 8500.

Yarmouth Roads, a roadstead in the North Sea, off Norfolk, affording fairly safe anchorage.

Yarn, spun fibres ready for being woven into cloth. When the fibres are simply twisted together, the material is known as single Y. Cotton Y. is counted by the number of single hanks of 840 yds. each in 1 lb. (avoirdupois); thus, Y. running thirty such hanks to the lb. would be called thirty counts. Linen Ys are of two kinds, line and tow. They are Yankton, co. seat of Yankton co., S. Dakota, U.S.A., the seat of an important college. Pop. (1910) 3787. Yanock (Cheironecles variegatus), a S. American marsupial about the

yards in 1 oz.; each district, however, has its own method of counting. Worsted Y. is smooth and strong. It is counted by the number of hanks of 560 yds. in 1 lb. Net silk may be Garrick Club and caused a breach or ganzine or Tram; the former is more twisted than the latter, but het have extensive them. Some silk he formed of the strength of the st both are extremely strong. Spun silk is made from the silk set aside in the manufacture of fabrics from the cocoons. Silk Ys. are counted by the weight of 1000 yds. in drams, or by the number of deniers in one hank, a denier being equal to stin lb. Ys. are folded for greater strength. Folded Ys. are counted according to the number of threads; thus two sixties means that two threads of sixty hanks to the lb. were twisted the quotient, together, therefore, being thirty hanks to the lb.

Yaroslav, or Jaroslav: 1. A gov. of Central Russia, with an area of 13,723 sq. m. It is watered by the Volga and its tribs, the Mologa and Sheksna. Flax and tobacco are grown, but the crops of wheat and rye are poor. The chief manufs, are chemicals, spirits, flour, and linen. Pop. 1,200,000. 2. The cap. of above gov., 160 m. N.E. of Moscow. It has a beautiful cathedral (1215), and

manufs. silk, bells, tobacco, and white-lead. Pop. 72,000.
Yarrell, William (1784-1856), an English naturalist, born at Westminster. He contributed articles to the journals of the Linnean and Zoological societies, of which he was a follow, and wrote a History of many of the Pacific islands. The British Fishes (1835-36) and History treatment consists of absolute cleanly of British Birds (1839-43).

Yarrow. or Milfoil (Achillea millefolium), a common wayside plant

(order Compositæ).

Yarrow Water, a small river of Scotland, which rises at Yarrow Clough in Selkirkshire, and flowing through lochs Lowes and St. Mary, enters the Ettrick 2 m. above Selkirk. Its praises have been sung by many Scottish poets as well as by Wordsworth.

Yass, a tn. of New South Wales, on the R. Yass, in the Yass Plains, with

deposits of gold and silver in the neighbourhood. Pop. 2500.

Yass-Canberra, a locality in New South Wales, Australia, the proposed site of the Federal cepital of the Commonwealth, lies about 150 m. S.W. of Sydney; 800 sq. in. being conviced in 1011. acquired in 1911.

Yassy, see Jassy. Henry een an He

Daily

After several journalistic ventures, he founded *The World* in 1874. Ten years later he published his *Reollections and Experiences*.

Yates, Frederick Henry (1797-1842), an actor, educated at Charterhouse. London, and went on the stage in 1818. In the following year he played with Charles Kemble and Young in Othello at Covent Garden, at which theatre he remained for six years. He then went to the Adelphi, which he managed from 1836 until his death. He was at his best in the classic roleof Falstaff and Shylock.

Yawl, see Sails and Rigging.

Yawning, an abnormal act of respiration. It consists of a long inspiration, followed by a short expiration. the mouth, fauces, and glottis being kept open. It is an involuntary act induced generally by fatigue, but is often due to imitation of another person's Y.

Yaws, or Frambasia, a tropica disease characterised by the formation of red, raspberry-like tubereles upon the face, toes, and genital organs. It is an infectious disease, and chiefly affects young negroes, though white men may suffer from it. It is endemic in the tropical parts of Africa, in Ceylon, East and West Indies, and many of the Pacific islands. The ness, together with the application of antiseptic lotions.

Yazoo City, the cap. of Yazoo co., Mississippl, U.S.A., 42 m. E.N.E. of

Mississiph, U.S.A., 42 m. E.N.E. of Vicksburg. Pop. (1910) 6796. Yeadon, a tn. of York-hite, in W. Riding, 4 m. S. of Otley, with woollen manufactures. Pop. (1911) 7442. Year. There are three kinds of Y. That most usually employed is the solar, tropical, or equinoctial Y. This is the period intervening between a is the period intervening between a position of the sun and the occurrence of the next identical position, after its cycle of ascent and descent on the meridian. This is conveniently taken from equinox to equinox, when the sun is vertical at the equator, or, as reckoned in the calendar, from winter solstice to winter solstice. The posttion of the sun is determined by the revolution of the earth in its orbit and by the melination of its axis. The change in inclination resulting in the precession of the equinoxe-(q.r.) causes the sun to appear in the same position earlier by 20 mins, then if the observation were made on a several star. The latter gives the true period plays and novels. In 1858 he was of revolution or sidereal Y., but as the

9 secs.; the tropical, 365 dys. 6 hrs. 9 mins. 48 mins. 46 secs. The anomalistic Y. is reckoned from perihelion to perihelion, and as the line of apsides (q.v.)moves constantly slowly eastwards, the length is greater by 4½ mins., being 365 dys. 6 hrs. 13 mins. 48 secs. the lesing 365 a..

This is used astronculations on perturbations on perturbations on perturbations.

This is used astronculations on perturbations.

The ligious observances soon introduced more accurate methods, which depended on the more easily recognised changes in the phases of the moon.

Lunar changes are, however, incommensurable with the tropical Y., and it was usual to have a least of a poet and critic, a native of Dublin. Yeats, William Butler (b. 1865), a poet and critic, a native of Dublin. Yeats, William Butler (b. 1865), a poet and critic, a native of Dublin. Yeats, william Butler (b. 1865), a poet and critic, a native of Dublin. Yeats, william Butler (b. 1865), a poet and critic, a native of Dublin. Yeats, william Butler (b. 1865), a poet and critic, a native of Dublin. Yeats, william Butler (b. 1865), a poet and critic, a native of Dublin. Yeats, william Butler (b. 1865), a poet and critic, a native of Dublin. Yeats, william Butler (b. 1865), a poet and critic, a native of Dublin. Yeats, william Butler (b. 1865), a poet and critic, a native of Dublin. Ye studied painting for a while at the numerous books of verse, notably. The Wanderings of Oisin, 1889; and Poems, 1899; while he has also edited the writings of Blake, and has issued volume of pure essays, Ideas of and Evil, 1903. His activities of pure content in Tub-

three Metonic cycle, discovered by Meton about 433 B.C., among the Greeks, reckoned from new moon to new moon, and contained 235 synodic months, approximately 19 years of 365½ dys. This cycle still remains in the Golden Number, which is found by adding 1 to the date number. is found by adding 1 to the date number and dividing by 19, the remainder being the required number; if 0, it is considered 19. The Calliptic cycle takes account of leap Ys., and consists of 4 Metonic cycles or 76 yrs. In the year 45 B.C. Julius Cæsar, with the help of Sosigenes, reformed the calendar, and introduced the bissex-tile Y., or leap Y., the sixth day before the kalends of March being counted twice. The previous Y. was made 445 dys. long and was known as the x. of confusion. The Y. being approximately 365‡ dys., and only 365 being counted, an odd day is added every four Ys. to compensate; these are leap Ys. This, however, overcompensates, and to allow for that century date numbers are only leap Ys. If divisible by 100. The fictibuse 445 dys. long and was known as the Y. Ys. if divisible by 400. All your reduction of star values of the reduction of star places, begins at the moment when the sun's mean longitude is 280°, the bare spaces in his prints appearing which always occurs some time during Dec. 31; the star catalogue takes no account of aberration or the irregular motion of the celestial pole, and the reduction is necessary bour, which is always ice free.

Yekaterinburg, see Ekaternburg.

seasons depend on the sun's position, position. The Julian cycle consists of it is more convenient to use the tropical Y. for every-day purposes, point is Jan. 1, 4713 B.C., Jan. 1, the former being more usual for land, astronomical calculations. The Ys. are used in astronomy as harmonising different chronological systems. Jewish Ys. are arranged in cycles of 19; the 'embolismic' Ys. the 3rd, 6th, 8th, 11th, 14th, 17th, and 19th have 13, the others 12

months each.
Yeast, or Saccharomyces, an organic compound consists of rounded.

the writings of Blake, and has issued a volume of pure essays, *Ideas of Good and Evil*, 1903. His activities have also been given to lecturing, both in England and America, while he was among those instrumental in founding the Literary Theatre in Dublin, and subsequently he has been closely associated therewith. His best trackly associated the with the particular interpretable associated the production in the control of t work is essentially Irish, reflecting just that wistful, pensive tempercharacterising the old Celtic bards of whom Y.

yecla, a tn. of Murcia, Spain, in a vine and fruit-growing district. Pop. 19,000.

Yedo, see Tokvo.

Yegorievsk, a tn. of Russia, in Ryangov. Pop. 24,000. zan gov. Yeisk, a scaport on the Sea of Azov,

Exports

Kuban province, Russia. grain. Pop. 42.000.

Yeizan, a Japanese artist. He appears to have lived early in the nine teenth century, and to have begun life as a maker of artificial flowers. Afterwards he worked as a designer of surinomo, these being virtually the Christmas cards of old Japan, but Ys. if divisible by 400. The fictilious anon he gave his energies to wood-Y., used in the reduction of star cuts done in emulation of Utamaro.

Yekaterinodar, or Ekaterinodar, the to the mosquito Slegomnia fusciala, cap. of Kuban prov., Russia, on the which was suggested by Dr. C. Finlar Kuban, with extensive trade in flour of Havana in 1881. Major W. C.

Yekaterino-Nibolsk, a township in the Amur prov., Siberia, on the Amur.

Yekaterinoslav, see EKATERINOSLAV. Yelatma, or Jeletma, a tn. of Tambov, Russia; manufactures farm tools. Pop. 9000.

Yelisavetgrad, see Elizabetgrad. Yelisavetpol, or Elisabetpol: (1) in Transcaucasia, Russia. tending from the Caucasus to borders of Persia. It is watered by measures so brunantly carried out in the Kur and the Aras. The southern the Panama Canal zone have con-region is very mountainous, and in the pletely confirmed the efficacy of the E. lie the steppes. The chief products methods. E. lie the steppes. The chief products of the soil are liquorice, mulberry, vine, and various crops. There are copper mines, silk works, breweries, etc. Area 16,721 sq. m. Pop. about 1,100,000, composed chiefly of Armenians and Tartars. (2) Cap. of above gov. It has many mosques, and its old fortifications still etand above gov. It has many mosques, and its old fortifications still stand. Pop. 38,000.

Pop. 38,000.
Yell, a gneissic island, second in size, of the Shetlands. Area 80 sq. m. Chief occupation is fishing. Pop.

(1911) 2348.

Yeliala Falls, the cataracts on the Congo, near Vivi, 110 m. from its mouth.

Yellow Bird, the name for two American birds, Chrysomitnis N. tristis, goldfinch or thistle bird, and

Mendonica astitus, reliow poll warbler.
Yellow Fever, or Yellow Jack, is an endemic fever occurring in tropical and subtropical regions except where rainfall is deficient; the region round the Gulle of China and the Carl the Gulf of Guinea and the Caribbean Sea are the noted areas and include the W. Indies. It has spread as an epidemic further northward into the U.S.A. With the usual rise of temperture, vomiting and rigor are found after an incubation period usually of from one to four days. This in slight cases is the whole course. Jaundice and hemorrhage are prominentsymp-toms, and as a rule a complete and serious reaction sets in after the first Hemorrhage becomes very prominent, stools and vomit being both affected. Both skin and kidneys exhibit hemorrhage, and it is also common from the guns; the urine also contains excessive albumen. The

and enemata are administered in a relievation of 7740 ft. above the level of the seca. It nutritious form, while the heart is stimulated by tonics. One attack usually gives immunity; the negro is then passes through a beautiful generated the Grand Canen. It joins the specific poison has not been discovered, the cause has been traced. Its chief tributaries are the Big Horn.

Kuban, with extensive trade in flour of Havana in 1881. Major W. C. and corn. Pop. 70,000.

Yekaterino-Nibolsk, a township in thorough tests in 1901. These were based on the prevention of breeding by the mosquito, by keeping all water vessels mosquito proof and covering puddles and stagnant water with oil; drainage and sanitation were thor. oughly inspected and improved with

Yellow Hammer, or Yellow Bunting (Emberiza Cilrinella), a common British bunting about 7 in long, with a yellow head streaked with brown, and a slightly forked tail. The nest is built on the ground, and contains five eggs. It feeds largely on in-cets, but fruit and grain are also eaten.

Yellow Pigments, see Pigments.
Yellow River, or Hoang-Ho, a riv.
of Chinn, which rises on the Odontala plain, in the territory of Kukunor, Tibet. After an extremely tortuous course, it crosses the Chinese province of Kansu, flows into Mon-golia, and then turns almost at right angles eastward into Shansi. It separates Shensi from Shansi passes through Ho-nan, and flows into the Gulf of Pechili. The most important towns on its banks are Lun-Chow and K'ai-fung, and its chief tributaries are the Wei-ho coming from the W., and the Ta-tung-ho from the N. The river has come to be known as 'China's sorrow 'on account of its tendency to burst its banks and to change its course. Formerly its mouth was in the Yellow Sea. Its dams and dykes date from very early times. The Y. R. is the second longest in China, and has a length of about 2500 m.

Yellow Sea (Honng-Hai, or Hwang-Hai), a large gulf of the Pacific Ocean. its length being about 620 m., and its greatest width 100 m. It is divided into the gul' Pechili, and Islands.

have been

mud carrier

Yellowetons a riv of the U.S.A.

Mts. of N.W. Yellowstone National Park, entering Yellowstone Lake at an elevation of

through the

Wyoming, Montana, and Idaho, and lies between 44° 8' and 45° 6' N. lat. It is less a park than a series of parks formed by different valleys on the two sides of the Rockies. Is subject to great extremes of climate, often freezing at night after scorching days. The whole region is of geologically recent volcanic origin, recent volcanic origin, and geysers are still active and famous. They are said to number over 10,000, They are said to number over 10,000. the largest being the Excelsior. Highest being the Excessor. The highest peaks in the park are the Washburn, Chittenden, Langford, Doane, Stevenson, Turret, Sheridan, Electric, Baronet, and Norris Mts. The chief lakes are the Four Cantons, Lewis, Heart, and Shoshone. Yellowstone is the chief river. The The whole region is one of wild and varied beauty and of all sorts of curious thermal phenomena. The first white to attempt an exploration of the region was a trapper named Coulter, who in 1805 traversed a part of this district. His tales were disbelieved, but were confirmed thirty years later by the discoveries of Bridger. In 1870 the first official survey was made, and in 1871 Hayden's famous expedition revealed the glories of the Yellowstone district. See Hayden's Reports, 1872, etc.
Yellow Wood, a name given to vari-

ous trees, principally Cladrastis tinctoria, a small leguminous tree, sometimes grown in gardens for its spikes

of white flowers.

Yemen, a region in S.W. Arabia, bounded on the N. by Hejaz and Nejd, on the E. by Hadramaut, on the S. by the Gulf of Aden, and on the W. by the Red Sea. It is divided into the four vilayets of Sana, Tais, Asiro, and Hodeida, and has an area of about 73,000 sq. m. Pop. (estimated) 750,000.

Yenikale, see KERCH or KERTCH. Yenisei, a river of Siberia (3000 m. Rises in Mongolia, and flows W. as far as the Russian border, and then N. to the Arctic Ocean. Area of basin about 1,000,000 sq. m. Drains the regions of Yenlseisk and S. Irkutek. Chief tributary the Angara. The chief town on its banks is Yeniseisk, the old cap. of the province. The river is very broad, and spreads out into a large estuary with several wide mouths. It is navigable in summer

for 1500 m.

Yeniselsk: 1. A large province of Siberia, between Yakutsk on the E. and Tomsk on the W. Area 921,295 sq. m. Slopes from S. to N. Is drained by the R. Yenisei. The pop. of the

Powder, and Rosebud. Total length warmer slopes in the S. grow grain 1000 m., of which nearly 800 are navigable.

Yellowstone National Park, U.S.A., occupies part of the territories of formerly cap. of foregoing. Has a considerable fur trade, and a flourishing market: a custom-house, an arsenal.

and four churches. Circumference of walls, 3 m. Pop. 13.000. Yeola, a tn. of the Nazik dist.. Bombay, India, with silk thread and cloth manufactures, and gold and Pop. 17,000. silver wire-drawing.

Yeoman was anciently a fortyshilling freeholder, and as such qualified to vote and serve on juries. more modern times it meant a farmer who cultivated his own freehold.

volunteer Yeomanry. cavalry forces organised in almost every county during the period following the French Revolution, a time when the danger of invasion was considered imminent. Since 1908 the whole Y. force has been absorbed into the cavalry section of the territorial

force. Yeomen of the Guard, an ancient royal bodyguard employed on state occasions as part of the sovereign's retinue. It was founded by Henry VII. and its members still retain the costume of the period of their foundation. It is formed of old soldiers of fine appearance and numbers 100 men. The vulgar name Beef-Eaters, by which the Y. of the G. are known, has no reference to the diet particularly favoured by them, but is a corruption of buffeliers, a name given them be-cause they were stationed in state banquets at the buffet or sideboard.

Yeovil, a municipal bor. and market tn. of Somersetshire, England, on the R. Yeo. The church of St. John the Baptist is a fine cruciform the Baptist is a fine cruci-form structure with a 15th century tower. Y. is noted for its manuf. of gloves. Pop. (1911) 13,760. Yerkes, Charles Tyson (1837-1905), a native of Philadelphia. He started

business as a stockbroker at the age of twenty-one with remarkable success, and about 1873 became connected with a tramway enterprise in Philadelphia, which he developed with great profit. A few years later he settled in Chicago, and there installed a tramway system which realised him a very considerable fortune. Y. also founded the Yerkes Observatory at Lake Geneva, and while resident in London, from 1901, devoted himself to improving the means of transit in and around the metropolis. He was associated with numerous tube and other railway undertakings, and had managing control of the District system, which he electrified. Yessel, see LISSEL.

Yessentuki, a vil. of Asiatic Russia

W. of Pyatigorsk; noted for its alka- which drops honey, sit an eagle, a line springs containing iodine and squirrel, and four stags. At the root

Yetholm, a vil. of Roxburghshire,

Scotland, on Bowmont Water, 7½ m. from Kelso. Pop. (1911) 755.

Yew, or Taxus baccata, a British evergreen tree, with linear leathery leaves and diocious flowers, followed

by bright rose-red cup-shaped fruits or arils. The tree attains a very great age; its wood is hard and close grained but splits readily. It was formerly used for making long-bows. Its leaves and seeds, but not the fleshy part of the fruit, are poisonous. It is used medicinally in India but not in Britain.

Yezd, a tn. of Persia, 165 m. E.S.E. of Ispahan, the centre of the silk industry of Persia. Y. contains eighteen mosques, one of which, the Masied i Yama, dates back to 1119.

Pop. 45,000.

Yezidis, or Shemsieh Kurds, a religious sect whose chief settlement is in the Sinjar hills, N. of the Mesopotamian plain. They are also found on the Van and Erzerum plateaux, in Persia, and in Transcaucasia, near the E. bank of Lake Gokcha. They hold beliefs derived from Mohammedan and various other sources, and are commonly called 'Devil Worshippers.' Their supreme being is Satan, whom they worship in the form of a peacock, and their great saint Sheikh Adi, whom they protend wrote a code of doctrine, the so-called Aswad, or 'Black' Book. The Y, are far superior morally to their Nestorian or Gregorian, Shiah, or Sunnite neighbours. They are perfeetly honest, showing a scrupulous regard for the property of others. They are also extremely courteous to strangers, kind to each other, faithful to the marriage vow, and of industrious habits.

Yezo, Yesso, Ezo, or Hokkaido, the largest of the islands of Japan.

roots run in three directions : one to the Asa gods in heaven, one to the station of Japan on Tokyo Bay, 14 m. frost giants, and the third to the under sworld. Under each root is a fountain of wonderful virtues. In the tree, Africa. The latter has an area of

lies the serpent, Nithhoggr, gnawing it, while the squirrel, Ratatöskr, runs up and down to sow strife between

the eagle at the top and the serpent. Yiddish (Ger. Judisch. Jewish), a polyglot jargon, used for interconmunication among the Jews. It is really a corrupt form of Hebrew, and prevails in the East End of London. where two daily papers, the Jewish Express and the Jewish Journal, each one half-penny, are published in this dialect. Y. is also commonly spoken in Central Europe See Max Grünbaum, Yiddish Chrestomathy, and Wiener, The History of Yiddish Litera-ture in the Nineteenth Century.

Ymuiden, or Ijmuiden, a scaport of Holland in the prov. of N. Holland, 6 m. from Haarlem. It stands at the end of the North Sea Canal, by which it is connected with Amsterdam. This canal, which is one of the most important waterways of Holland for transmarine traffic, was widened and made deeper in 1911. Pop. 2500.

Yo-chow, a city in the prov. of Hunan, China, at the outlet of Tungting lake. It is a depôt for native products destined for export and for foreign goods on their way inland. Pop. 20,000.

Yoga, the fourth of the six systems of Hindu philosophy, commonly regarded as a theistic development of the Sankhya, directly acknowledging Ishvara, or a supreme being. Its alleged author is Patanjali, and its aim is to teach the means by which the human soul may attain com-

Polete union with the Supreme Soul.

Yokkaichi, a tn. of Japau, 50 m. F.
of Kyoto. It is one of the thirty-three
ports of Japan which are places of
call for foreign steamers. It was
opened in 1899. Pop. about 30,000.
Yelshame

Yokohama, a scaport of Japan on Tokyo Bay in the Is. of Honshin. It largest of the islands of Japan. Honshiu lies to the S., and Saghalien to the N. Area 36,289 sq. m. The lie inprovements were begun in 1912, of the mountains is from N. to S., there being many volcanoes. The island is partly of volcanic origin. It has many good harbours. The N. is fertile, producing wheat, rice, and timber. Gold and silver are mined. The primitive Ainos have been some lapanese in the treaty port on the W. side of the primitive Ainos have been some lapanese in the treaty port on the W. side of the primitive Ainos have been some lause of the better anchorage at Y. The chief imports are cottons. The chief imports are cottons, mythohas a good and commodious harbour, mytho-inds to-leum; the chief experts silk, tea, gether heaven, earth, and hell. Its copper, and coal. Pop. 394.303. roots run in three directions: one to Yokosuka, a scaport and my all the copper and coal.

Yonge, Charles Duke (1812-91), York, a city and borough of Engregius professor of modern history land, cap. of Yorkshire, seat of an and English literature in Queen's archbishoppic, on R. Quee, 175 m. College. Belfast; born at Eton. He'N.N.W. of London. Was a British was at first occupied by literary work and a Roman city, being known to in London, but in 1896 was appointed the Romans as Eboracum. Constanto the above-named chair which he time the Great was probably born held fill his death. Among his many there. Here always held a his resi

Yonge, Charlotte Mary (1823-1901), a novelist, born at Otterbourne. She published various historical works, a book on Christian Names, a Life of Bukop Patteron, and a monograph of Hannah More; but she is chiefly remembered as the author of The Heir of Reddyffe, which she published in her thirtieth year, The Daisy Chain, and Modern Broods, all of which were

extremely popular.

Yoni, see Linga Puja. Yonkers, a city of Westchester co., New York, U.S.A., on the Hudson R., N. of and adjoining New York City. It is a great manufacturing town, and produces carpets and rugs, and foundry and machine-shop products, besides confectionery, furniture, and hats. Pop. (1910) 79,803.

Yonne, an agricultural deput. Central France, with an area an agricultural dept. of 2592 ag. m. It belongs to the basins of the Seine and the Loire, chiefly the former, and has a temperate climate, except in Morvan, where the extremeof heat and cold are greater, and where the rainfall is most abundant. Wheat and oats are the chief cereals, and the vine covers about 6 per cent. of the

Surface. Cap., Auxerre. Pop. 305.552.
Yorck (or York) von Wartenburg, Johann David Ludwig, Graf (1759-1239), an officer in the Prussian army, dismissed for insubordination (1778); he served in Holland for a time, re-turning to Prussia in 1786. Y. won distinction in the Polish campaign (1794), and commanded the Prussian

16,009 sq. m. and an estimated popu-troops of Napoleon's 'Grande Armée' lation of 209,500. The chief crops are (1812). After Prussia's withdrawal cotton, rice, and tobacco. The town from the French cause, he fought at on the R. Benne is the capital of the Dannekow, Wartenburg. Mockern, province, and was founded by the Leipzig, Montmirail, and Laon (1813-Fula conqueror, Adama, about the 14), and was created field-marshal middle of the 19th century.

(1521). See Droysen, Leben (16th ed. Yonezawa, a tn. of Japan, Hon-1889); W. von Vosz. York' in shiu. 63 m. from Niigata. Pop. Exticher des presurschen Heeres, iv., 25.380.

Yonge, Charles Duke (1812-91), York, a city and borough of Engregius professor of modern history land, cap. of Yorkshire, seat of an

to the above-named chair which he time the Great was probably born held till his death. Among his many there. Has always held a high posiworks are: An English-Greck Lexicon; tion among English towns, and condand from the Earliest Times to the cluding the Minster, founded 626; the Peace of Paris; Parallel Lives of present nave was built in 1291, Ancient and Modern Heroes, of and this cathedral is the finest Gothic Epaminondes and Gustavus Adolphus, building in the world; the churches Philip of Macedon, and Frederick the, of St. Michael-le-Belfry and St. Margrett, An edition of 'Virgil' with tin's in the Late Perpendicular style, Notes: A History of the British Nary the ancient Guildhall, etc. The prosfrom the Earliest Period to the Present perity of Y. has declined in comfine; History of France under the parison with that of other towns, but Bourbons; The Constitutional His it remains an important residential tory of England from 1750-1260; Our and ecclesiastical centre. There are a few unimportant manufs., and a still Yonge, Charlotte Mary (1823-1901), fourishing market. Pop.(1911)52.237 flourishing market. Pop. (1911) 82,297.

York: 1. A city and co. seat of York: 2. A city and co. seat of York co., Pennsylvania, U.S.A., on the Condorus Creek, 28 m. from Harrisburg. It has manufs, of foundry and machine shop products, tobacco, silk goods, food products, confectionery, shirts, and patent medicines, and is the trade centre for a rich activatival region. for a rich agricultural region. Pop. (1910) 44,750. 2. A municipal tn. of (1910) 44,750. 2. A municipal th. of Western Australia, 77 m. E. of Perth. It is situated 550 ft. above sea-level in a district which is the principal source of the sandal-wood supply. Pop. 3600. 3. A river in Virginia, U.S.A., formed by the confluence of the Pamunkey and Mattapony Rs. It is the tidal expury of the rivers It is the tidal estuary of the rivers which begins at West Point and flows

S.E. to Chesapeake Bay.
York, Cardinal, see STUART, or
STEWART, HENRY BENEDICT MARIA

CLEMENT.

York, House of, a branch of the English royal dynasty of Plantagenet, descended from Lionel, Duke of Clarence, third son of Edward III., and Edmund, Duke of York, fifth son and Edmund, Duke of York, fifth son of Edward III. The head of the house was Richard, Duke of York, who was killed in the battle of Wakefield, 1469. His sons, Edward IV. and Richard III., and grandson, Edward V., were kings of England, 1461-85. The descendants of Edward IV.'s brother Christ of Claracel and sister (Figure 1981). (Duke of Clarence) and sister (Elizabeth) became claimants after 1485. The last serious claimant was Richard

de la Pole (d. 1525). The title, Duke, being a speciality. of York, is now generally borne by of York, is now generally forme by the second son of the reigning mon-arch. Henry VIII. and Charles I. both held the title previous to the death of their elder brothers, and James II. also was Duke of York before his accession to the throne, as was his present majesty, King George V., before he became Prince of Wales. Yorke, Philip, see HARDWICKE, PHILIP YORKE, first EARL OF.

York Plays, see MIRACLE PLAY. Yorkshire, a N.E. maritime co. of England; bounded on the N. by Dur-ham, S. by the shires of Nottingham and Derby, E. by the North Sea, and and Derby, E. by the North Sea, and W. by Lancashire. It is the largest county in England, and is divided into three Ridings, N., E., and W., each forming a separate administrative county. The coast-line is fairly even with cliffs of an average height; the largest indentation is that formed by the mouth of the Humber, others being Bridlington, Filey, and Robin Hood bays. At Boulby the cliffs reach a great height (666 ft.), and again at Flamborough Head; Spurn Head at the mouth of the Humber being the other principal headland. The surface of the county is varied, being mountainous and moorland in the N., while the centre is a vast plain; in the N. also are beautiful valleys or dales. In the N.W. is the Pennine Range, reaching an elevation of 2414 ft. at Whernside; in the N.E. are the Cleveland and Hamilton Hills. and in the E. are the Wolds. principal rivers are the Ouse (which with the Trent forms the estuary of the Humber, and is itself formed by the junction of the Swale and the Ure) and its tributaries the Wharfe, Aire, and its tributaries the Wharie, Aire, Calder and Don, with the Derwent on the E. In the N. is the R. Tees, and in the W. the Ribble. The principal dales are Teesdale, Wensleydale, and Airedale. On the const are a number of well-known watering places, of which the most important are Scarborough. Whithy Elley and are Scarborough, Whitby, Filey, and Saltburn-by-the-Sea. Scarborough is famous for its spa, as is also Harrogate, and there are mineral springs at several other places. Y. possesses valuable coalfields in the W. Riding, iron ore is obtained in large quantities (about 2,500,000 tons of pig-fron being obtained in the Cleveland being obtained in the Cleveland district yearly), and lead, slates, lime-stone, fartisized, and largelay are also worked. The in linking is the great agricultural divine. One and barley are the main crops, with turnips and swedes; flax and liquorice are also grown. Sheep farming is carried on largely in the N. and W. Ridings, and the letter is famed for its cattle. Pies the latter is famed for its cattle. Pigs are kept in large numbers, bacon coated dog, with long straight silkr

being a speciality. Dairy farming flourishes, cheese making being an important branch, and hunters and carriage horses are bred. The great manufacturing centres are in the W Riding; woolien and worsted goods rank first at Leeds, Bradford, Halifax, Huddersfield, etc.; iron and steel goods come next with their centre at Sheffield, which is especially noted for plate and cutlery; leather is manufactured at Leeds, and there are chemical works, paper making, etc., among the lesser industries. Communication is excellent; besides the railways there is a system of canals railways there is a system of canar-which connects with the fea, the principal ports being Middlesbrough on the Tees, Hull on the Humber, and Goole on the Ouse. The county returns 26 members to parliament. York is the county town.

Y. formed part of the ancient king-doms of Deira and Elmet, was conquered by the Danes in 875, and came under the rule of Harold of England in 1066 after the battle of Stamford in 1066 after the Dattle of Standord Bridge. Since that date the county has been the scene of many battles: in 1138 the Scots were defeated at the battle of the Standard, North-allerton; in 1322 Edward II. de-feated the barons at the battle of Boroughbridge; in 1399 Richard II. was murdered at Pontefract Castle; in 1463 the Wars of the Roses comwas murdered at Ponteiract Castic; in 1453 the Wars of the Roses commenced with the fight at Stamford Bridge; and in 1460 the Duke of York met his death at Wakefield. During the Civil War the county was divided, and the principal battle was that of Marston Moor, when the Parallets was defeated. Y is rich Royalists were defeated. in antiquities; among the numerous castles the best known are those of Pontefract, Knaresborough, Richmond, Scarborough, and Skipton. Bolton Castle was one of the many prisons of Queen Mary; Carwood Castle was onee the palace of the archibishops of York, and a residence of Wolsoy; Conisborough Castle has been immortalised by Sir Walter Scott in Iranhoe; and there are others too numerous to mention. Of the ecclesiastical remains the most important are the abbeys at Bolton and Fountains, the Benedictine abbey of St. Mary at York, and the Cistercian abbey of Rievaulx; there are many others, besides a number of beautiful churches, of which the Minster at York (q.v.) is the finest. The area is: E. Riding, 1083 sq m.; pop. (1911) 507,096, N. Riding, 1995 sq. m.; pop. 417,075, W. Hiding, 2736 sq. m.; pop. 3,014,980. See Victoria County History-1'orkshire.

Yorkshire College, see Lumbs. Yorkshire Terrier, a small long. hair reaching to the ground from the Raleigh's house, and other interesting back of the head to the tail and parted buildings. There are salmon-fisheries in the middle of the back. It is blued and exports of corn and livestock, grey with tan on the head, ears, and Bricks, earthenware, and fine pointlegs. The ears are small, V-shaped, lace are made. Pop. (1910) 5300. and carried semi-creet; the body is compact and level on top of the back. [87), an American chemist and scientification of the Parter of the Parter Science. The weight is about 5 lbs. It needs daily grooming, the coat being brushed

rorupa, or xarriga, a lettile and densely nopulated region of W. Equatorial Africa, included in the British colony of S. Nigeria. It lies S. W. of the Lower Niger (Quorra), adjoining Dahomey on the W. and Nupe on the N.E., and reaching from Borgu nearly to the Bight of Benin. Among the chief towns are Ibadan (chief commercial centre), Oyo (capital), and Abcokuta (capital of Egba province). Agriculture and cattle-rearing are carried on. Area about 18.500 sq. m. Pop. about 2,000,000. The people are negroes of some culture. The Mohammedan 2,000,000. The property of some culture. The Mohammedan Fulahs captured llorin and destroyed the old native Y. kingdom (1820). See Ellis, The Foruba-speaking Peoples, 1894; Gouzien, Manuel Peoples, 1894; Gouzien, Manuel Peoples, 1895.

Yosemite Park, Central California, a national park embracing the Yosemite Valley, U.S.A. The region is composed of granite, but the river valley is extremely beautiful, with all

infirmary (c. 1812). include: The Horse, His works

tist, founder of the Popular Science The weight and adding rooming, the coat density grounding, the coat density grounding, the coat density growing at a side.

York co., Virginia, U.S.A., on the York R. Here the last important started scientific lectures in America battle of the Revolutionary War was (1852), published a chemical chart fought in 1781 when Lord Cornwallis (1851), planned the 'International surrendered to Washington. Pop. Scientific Series' (1871), and wrote among other works Alcohol and the Constitution of Man, 1853; Handhook of Household Science, 1857; and introductions to The Correlation and Conservation of Forces, 1864; and The Culture Demanded by Modern Life, 1868. He did much to popularise the works of H. Spencer. See Fiske. Life and Letters, 1894.

Young, Andrew (1807 - 89), a Scottish schoolmaster and poet, best known for his hymns, the most famous being There is a Happy Land. He was headmaster of Niddrie Street school (1839-41), head English master at Madras College, St. Andrews (1840-53), and then moved to Edinburgh, taking up philanthropic work. His works were collected as The Scottish Highlands and Other Poems, 1876. See

Julian, Dictionary of Hymnology. Young, Arthur (1741-1820), an agri-Yosemite Park, Central California, Young, Arinur (1/41-1820), an agriu national park embracing the culturist, was a practical farmer and
Yosemite Valley, U.S.A. The region is composed of granite, but the river valley is extremely beautiful, with all! The Farmer's Letters to the People of
kinds of flowering plants and tall England, 1767; Observations on the
trees for the 6 m. of its length. The Present State of the Waste Lands of
Nevada Falls are among the finest in Great Britain, 1773; Political Arithmetic, 1774; A Tour in Ireland, 1780,
Bolling and his soldiers who were written after tree very recognition. trees for the 6 m. of its length. The Present State of the Wase Lands of Sevada Falls are among the finest in the world. Discovered in 1851 by metic, 1773; Political Arithmetic world. Discovered in 1851 by metic, 1774; A Tour in Ireland, 1780, Bolling and his soldiers who were written after two years' experience as agent to Lord Kinghorough in county was made a national park by Act of Cork; the voluminous Annals of Congress in 1864. It is still inhabited by a few Indians. See Whitney, The Kovemile Book, 1868.

Youatt, William (1776-1847), an Society in 1773, and appointed in 1793 Enclish veterinary surgeon, came secretary to the Board of Agriculture (1810) and with D. P. Y. left behind him an Autokio-Blaine (d. 1848) opened a veterinary graphy, ed. by M. Betham-Edwards infirmary (c. 1812). His works (1898). (1898).

infirmary (c. 1812). His works (1898).
include: The Horse, 1831, 1843; Young, Brigham (1801-77), an Ireatise on Cattle, 1831; The Pig, American, president of the Mormon 1847, 1860; and he edited The Veterical American, president of the Mormon 1847, 1860; and he edited The Veterical American, president of the Mormon 1832, and perhaps the 6th and 7th editions of the Complete Grazier. See Simond, Biographical Sketch, 1896.

Youghal, a municipal bor., market th., and seaside resort of Cork co., Munster, Ireland, on the W. side of the Blackwater estuary, about 27 m. E. of Cork, of which it is a sub-port. It contains St. Mary's church (11th this was abolished by the governitt contains St. Mary's church (11th ment (1869). See Mormons, by century), a college founded in 1464, Mackay (1851), Gunnison (1852),

··· versity

· for machinery

an actor, went on the provincial stage in 1798 and came to London nine years later, when he played Hamlet with success at the Haymarket. In the following year he joined John Philip Kemble's company at Covent Garden, and played most of the leading Shakespearlan rôles. He acted

with Kean at Drury Lane in 1822. He retired in 1832. Young, Edward (c. 1683-1765), an English poet, educated at Winchester College and Oxford. Y. entered holy orders (1727) and became rector of Welwyn, Hertfordshire (1730). His most famous poem, The Complaint, or Night Thoughts (1742-46), was inspired by the death of his wife, Lady Elizabeth Lee. The work abounds in hyperbole and antitheses, but was much admired. There are German (1881), He became chief charity translations by Ebert (1760-71 translations by Ebert (1760-71 zel-Sternau (1825), and Von hausen (1844). Other works

the tragedies Busiris (1719) and The i Revenge (1721); The Love of Fame, the Universal Passion (1725-28), in verse; and The Centaur not Fabulous (1758), in prose, both satires; and an essay On Original Composition (1759) (sec Shakespeare-Jahrbuch, 1902). collected Works were published 1757. See ed. with biography by Doran (1854). Consult Croft in Johnson's Lives of the English Poets; Mitford's Life (1854); Villemain, Euvres, vii., 317, x., 313 (1856); G. Ellot, Essays, 1884; Barnstoff, Young's Nachtgedanken, 1895; Thomas, Le Poète L'oung in

Germany, 1906. Young, Sir Frederick (1817-1913), a fame

bered of the in life Greece

hausen (1844).

His we two divisions: first, to found (in his own words) 'a permanent union of the mother country and her colonies '; second, to save open spaces for the public, as in the cases of Epping Forest and Victoria Park. His chief Forest and Victoria Paris. In Semis-books are: Long Ago and Now. 1863; Imperial Federation, 1876; A Winter Tour in South Africa; A Senate for the Empire; Exil Party; and A Pio-

· · Lord judge,

Hyde (1857), Stenhouse (1873). Ken-nedy (1888). Liberal M.P. for Wigtown Burgle Young, Charles Mayne (1777-1856), (1865, 1868, 1874), his seat being warmly contested on the last occasion. He drew up a Public Health Act for Scotland (passed 1871), and was admitted as an honorary bencher of the Middle Temple (1871). Y. retired from his position as judge (1905). See Dr. Guthric's Memoirs, il. 291: Notable Scottish Trials, p. 286; Scots-man (May 12 and 23, 1907). Young, Sir George, third Baronet (h. 1832). an English bayyer edge.

(b. 1837), an Enrish mwycz, cated at Eton and Cambridge, grand-cated at Eton and (1802-39), whose son of W. M. Praed (1802-39), whose works he edited (1864-88). Ŷ, was a die Immi-

0) served mmission under the endowed (1903-6), and advocated

Essays 1862; Verse. 1888, 2nd ed., 1906; Poems from Victor Hugo, 1902.

Young, James (1811-83), a Scottish chemist, assisted Thomas Graham at the Andersonian Institution, Glasgow (1832), and later at University College, London. He became manager of Messrs. Muspratt's chemical works at Newton-le-Willows (1839), and of Messrs. Tennant's at Manchester (1814). In 1847 he began his analyses ceeded in pro----ceeded in pro-

mps. In 1850 Y, took out a patent for the dry distillation of coal, and thus obtained various oils and paralila. Works were erected at Bathgate and Addi-well, and in 1866 a limited company was formed. Y. did much to develop the American petroleum industry. Lyon Phayfair and David Living-stone were both his friends, and he sent an expedition in search of the sent an expedition in search of the intter (1872). See Blaikie, Personal Life of Livingstone, 1880; Wemyss Reid, Memorials of Playloir, 1883; Chemical News, xlyii., 1883; Mills, Destructive Distillation, 1866. Young, Robort (1822-88), a Scottish missionary and biblical scholar, set

up as a printer and bookseller (1817), and superintended the Mission Press at Surat (1856-61). He was head of burgh, the missionary institution at Edin-), was burgh (1864-74), and noted as an (1862- Oriental scholar and linguist. His vocate works include: Bible Commentary, (1869-74), and senator of the College 1870; Analytical Concordance to the of Justice. Y. was sheriff of Inver-Bible, 1879; Grammalical Analysis ness-shire (1853-60) and of Berwick of the Hebree, Chaldaic and Greek

Young, Thomas (1773-1829), an English physician, physicist, and Egyptologist, born at Milverton, Somersetshire. At an early age he studied languages, but afterwards decided to adopt the profession of medicine, and studied in London, Edinburgh, and Göttingen. He soon settled in London as a physician, and continued to practise till his death. He devoted himself to the study of natural philosophy, and wrote papers On Vision, and Oullines of Experiments and Observations respecting Sound and Light. The subject was resumed in his other papers, The Theory of Light and Colours (embracing the fact of the interference of light, then first made known) and Experiments and : . to Physical Optic.

lished his Lectures on Natural Philosophy, which involved a great deal of research. He became secretary of the Board of Longitude in 1818, and after the dissolution of that body, conductor of the Nautical Almanac. Y. also did much work in the interpretation of Egyptian hieroglyphics, and was the first to translate the inscription on the Rosetta Stone.

Young England, a section of the Conservative party, whose spirit and aim is well shown in Disraeli's Coningsby. The author of this novel and Lord John Manners, Duke of Rutland, were the chief leaders of the movement, which aimed at a revival of the medieval relations between the upper and lower classes, as an anti-dote to the rapid spread of democratic principles. The movement began about 1842.

Young Europe, Young Europe, an international association formed in 1834 to link together the various democratic unions which had been formed in the various European countries, such as Young Germany, Young France, Young Italy, etc. Its headquarters were in Switzerland, but its influence was of very short duration.

Young Germany, a school of German writers which flourished from about 1830 until the revolution of 1848. They were liberal and rationalistic in tone and aimed at making literature a force in national life. Among its chief exponents were Heine, Gutzkow, Laube, Heller, and Wienbarg.

Laube, Heller, and Wienbarg.

Young Ireland, an Irish political party which arose during the forties when the agitation for Irish Home Rule became intense. Its aim was to unite the Catholics and Protestants of Ireland in a final united attempt to sever the union between England and Ireland. It brought about a slight but unavailing insurrection.

Renaissance town-hall, and the Templars' houses. Its woollens were moted in the 14th century, but the chief manufs. are now laces, linen, and thread. Pop. 17,070.

Ypsilanti, or Hypsilanti, a noble Greek Phanariot (Fanariot) family descent from the Comneni, slight but unavailing insurrection.

Scriptures, 1885. Sec Schaff, Ency. Its chief leaders were Thomas Davis, of Living Divines, 1887. Gavan Duffy, John Mitchell, John Young, Thomas (1773-1829), an Dillon, and William Smith O'Brien.

Young Italy, a political association organised by Mazzini in 1831, which aimed at freeing Italy from Austrian domination, and uniting it under a democratic form of government. Its work ceased after 1848.

Young Men's Christian Association (Y.M.C.A.), an association for banding young men together in an effort to improve themselves, spiritually, intellectually, and physically, founded in 1844 by (Sir) George Williams, then a clerk in a drapery establishment. The movement, thus started, spread rapidly throughout London and the provinces, and under a slightly different form in America. As its aims grew more ambitious, and its range greater, more organisation was necessary, and the first great international convention was held at Paris in 1855. It now embraces more than 8000 associations and has close on a million members. The year 1912 was marked by the erection of the Central Y.M.C.A. Institute in Totten-ham Court Road, from which all in-formation about the association can be obtained.

Youngstown, the cap. of Mahoning Youngstown, the cap. of Mahoning Co., Ohio, U.S.A., on Mahoning R., 65 m. S.E. of Cleveland. It has coal, iron, and lumber industries, foundries, blast-furnaces, and machine shops. Pop. (1910) 79,070.

Young Turk Party, see TURKEY.
Young Women's Christian Association (Y.W.C.A.), an association formed in 1855 on the lines of the Y.M.C.A. to minister to the needs of the other sey. It was re-organised

of the other sex. It was re-organised on a universal basis in 1894, and now fifteen associations includes having its headquarters in a separate country. The British association is geographically into divided divisions. It has close on 2000 branches and a membership of over It issues a variety of pub-100,000. lications.

Ypres (Flemish Yperen, Ypern), a fortified tn. of W. Flanders prov., Belgium, on the Yperlee, 12 m. from Seignin, on the Therice, 12 m. from Courtrai. It was famous in the middle ages. Its markets, 'Les Halle' (1201-1342), and St. Martin's Church date from the 13th century. It contains a Gothic meat-market a Renaissance town-hall, and the Templars' houses. Its woollens were noted in the 14th century, but the chief manufa are now laces liner.

podar of Wallachia (1774-82, and from 1790-92), and dragoman of the He was killed by the Turks on a charge of treason. 2. Constantine, his son (d. 1816), was also hospodar of Moldavia (1799) and Wallachia (1802-5). Deposed (1805), he fled to Russia, and next year at Bucharest again tried to liberate Greece, but was unsuccessful. 3. Alexander, son of above (c. 1792-1828), was a patriot who fought in the Greek War of Independence. He served in Russia (1812-13), was chief of the Greek 'Hetairists' (1820), but misused his power, and after a crushing defeat at Dragashan (1821) surrendered to the Austrians, was im-prisoned for years, and died in Vienna. See La Garde-Chambonas, Souvenirs. 4. Demetrius (1793-1832), his brother, helped to capture Tripolitza (1820), checked the Turks by his defence of Argos, and resisted Ibrahim at Napoli (1825). He tried to emancipate the Christians in Turkey, and was appointed Greek commander-inwas appointed Greek commander-inchief in E. Hellas (1828-30) by Capo d'Istria. The city in Michigan, U.S.A., was named after him (1825). 5. Nicholas, another brother, left Mémoires, edited by Kamboroglous (1901). See Philemon's Aostuor (1950) ίστορικὸν (1859), and W. A. Phillips's War of Greek Independence (1897).

Yriarte, Charles Emile (1832-98), a French author, born in Paris and educated as an architect. He acted as a war correspondent in Morocco (1859) and Sicily (1860), and in 1881 entered the government service. His His

Autour des Borgia, 1890.

Yriarte, Tomas de (c. 1750-91), a scholar and poet, born in Teneriffe; obtained a civil appointment at Madrid, and edited the Madrid Mercury. His works include: La Mercury. His works include: La Cattle are raised, and sugar, tobacco. Musica, 1779; Fabulas literarias vanilla, maize, cotton, coffee, and (Eng. translation, 1855), and El hemp are grown. Pop. 337,020. The Senorito mimado, a comedy.

Ysopet, the name given to collections of fables in mediaval

literature, the word being a

consists of 103 fables in octosyllable couplets, taken from 'an English version of a Latin translation of the Greek.

Yssingeaux, a tn. of Haute-Loire, France, on a height 13 m. N.E. of Le Puy. Pop. 7700.

nople. Among the chief members harbour. It manufs machinery were: 1. Alexander Ypsilanti (1725-tobacco, matches, and chicory, and 1805), a statesman and soldier, hos-has shipbuilding yards. Pop. 11,305.

Ystradylodwg, see RHONDDA.
Yttrium (Y, 89), a rare metallic element allied to aluminium. It yields colourless salts, and forms an

oxide, Y.O.. Yū (d. 2197 B.C.), a Chinese emperor. the last of the three famous 'nncient kings' of great virtue, the others being Yao and Shun. He constructed valuable defences many His reign, which began in flood. 2205 B.C., marks the beginning of the

first, or Hia, dynasty.

Yuan Shih-kai (b. 1860), a Chinese statesman, born in Honan. In 1882 he went to Korea, becoming Chinese imperial resident at Scoul, capital, in 1881. He was expelled at the time of the Chino-Japanese War in 1893. In 1897 he was appointed judicial commissioner of Chi-li; in 1898 expectant vice-president of a board; in 1899 Junior Vice-President of the Board of Works; in 1900 governor of Shantung, and in 1901 viceroy of Chi-li. He was directorgeneral of the northern railways, and consulting minister to the Govern-ment Council in 1902; minister of the Army Reorganisation Council in 1903: president of the Board of Foreign Affairs, and grand councillor (1907); and 'senior guardian of the heir apparent' in 1908. He was made Tukuang viceroy when the revolution broke out in 1911, and was Premier for a short time. On Feb. 19. 1912, he was elected provisional president of the Chinese republic.

Yucatan: 1. A peninsula of Central America, in S.E. Mexico. Length. 280 m.; mean breadth, 200 m.; coastworks include: Portraits paristiens, 280 m.; mean breadth, 200 m.; const-1863; La Vie d'un Patricien de line, 700 m.; area, 65,400 sq. m. The Venise, 1883; Florence, 1880; and coast on the N. and W. is low and sandy, but higher and more indented on the E. relies of th ٠, A state of bove peninsula. Area, 35,205 sq. m. Cattle are raised, and sugar, tobacco, cap. is Merida.

Yucca, or Adam's Noedlo, a genus of overgreen shrubs (order aring, when of a good

literature, the work scale in the control of a to the work of Marie de France, which lous flowers from the centre of a to the work of Marie de France, which lous flowers from the centre of a to the kinear leaves. I filimentosa is hardy, and flowers at an earlier stage than other speeles.

Yuen, or Yuan, a Mongol dynasty which ruled China during 1280-1367. It was founded by Kublai Khan, who built the new capital of Knanballgh Ystad, a scaport of Malmöhus län, (Cambaluc), later Peking. He died in Sweden, on S. Baltic coast, 34 m. 1294. Other rulers of this dynasty S.E. of Malmö, with a good artificial were Yuen-cheng (d. 1307). Wu-tsung

Yüen-chang in 1367.

Yuga, a term in Hindu mythology used of long periods of time, or 'ages of the world. These are four in number: (1) Krita, the golden age; (2) Treta, the age of wisdom; (3) Dyapara, the age of sacrifice; (4) Dyapara, the age of sacrince, (x) Kali, the age of darkness, which becan in 3101 B.c. The length of these ranges from 4000 divine years (Krita) to 1000 divine years (Kali).

Yukaghirs, a Siberian people, living E. of the R. Lena. They are one of the peoples known as Hyperboreans, and are lighter in colour than neigh-

bouring tribes.

Yukon: 1. A territory of N. W. Canada. Area 206,430 sq. m. The N. and W. are mountainous, but in some places the valleys can be utilised for growing crops. Y. owes its prosperity to the discovery of the gold mines in the Klondyke region (1896), when thousands of goldseckers crowded in to share the spoils. Pop. 28,000. 2. A river of the Yukon territory, formed by the junction of the Rs. Lewis and Pelly. Length 2300 m., of which under favourable conditions some 1500 m. are navigable from the mouth in the Behring Sea. It was first explored from source to mouth Irst explored from source to mouth in 1883 by F. Schwatka. Dawson's expedition in 1887 settled many points in connection with the geography of the river. See The Annual Report of the Geological Survey of Canada, 1888-89; see also W. Ogilvie, Early Days on the Yukon, 1913.

Yule (O.E. geola, gehhol, etc.), the old name for Christmas, originally applied to the winter solstice and the

rejoicings held at that time.

Yule, Sir Henry (1820-89), a British geographer and Orientalist, born near Edinburgh; joined the Bengal Engineers (1840), and served in the Sikh wars, and with Colonel Phayre's mission to Ava (1855). His works include: Narrative of the Mission to the Court of Ava, 1858; Cathay and the Way Thither, 1866; Book of Ser Marco Polo, 1871-73; and Hobson-Jobson, 1886. Anglo-Indian colloquial a_B dictionary.

Yuma (sons of the river), a tribe of N. American aborigines, being the most important branch of the Yuman stock. Originally living in Arizona and California, about the Colorado R., they now occupy a reservation in S.E. California. Their numbers, which are rapidly decreasing, are now about 650. They are of good physique and

prov. of China, bounded on the N. Hanse towns. Pop. 44,140.

(d. 1312), Jén-tsung (d. 1320) and and E. by Szechuen, Kweichow, and Shun-ti, who came to the throne in Kwangsi, and on the S. and W. by 1333, and was driven out by Chu Annam, Siam, Burma, Tibet, the Shan states, and Tongking. 146.680 sq. m. The surface is mainly a lofty, uneven plateau, broken by mountain ranges and the gorges of mountain ranges and the gorges of rivers. The mountains are highest in the N., where they reach 17,000 ft., sinking 7000 or 8000 in the S. The chief rivers are the Salwin, Yang-tse-kiang, Me-kong, Si-kiang, Song-ka, and Schweli. The plains and valleys are fortile and accounting and schedules. are fertile, and agriculture and stockraising are largely carried on, parti-cularly in the S. and S.W. Excellent tea is produced. The mineral wealth is considerable and includes copper-ore, which has been mined for many ore, which has been mined for many years, gold, silver, lead, tin, and anthracite. Pop. 12,324,574, being 84 per sq. m. The capital, Yunnan-fu stands on lat. 25° 3′ N.; long. 102° 40′ E., near the N. shore of Lake Tienchih, and on a great plateau at an elevation of 6400 ft. It is a walled city with numerous canals and has a large trade. Pop. about 100,000.

Yusafzais, a group of Afghan tribes, inhabiting a district stretching from the Black Mountain to the Utman Khel territory. They take their name from their founder Yusaf, son of Mandai, and number about 700,000. Yusuf - ibn - Tashfin. see Almora-

VIDES.

Yuzgat, a tn. of Angora, Asia Minor, 85 m. N.W. of Kaisarieh, noted for its horses. Pop. 15,000.

Yverdon, or Yverdun, a tn. of Vaud, Switzerland, at the N. end of Lake Neuchâtel, 20 m. N. of Lausanne, with a 12th century castle used as a reheal.

school. Pop. 8626.
Yvetot, a tn. of dept. Seine-Inférieure, France, 20 m. N.W. of Rouen, with important textile manufactures. It was formerly the capital of a small independent territory of the

same name. Pop. 7100. Yvon, Adolphe (1817-93), a French historical painter, born in Moselle, studied under Paul Delaroche in Paris and visited Russia in 1843. Paris and visited Russia in 1843. His works include: 'Repentance of Judas,' 1846; 'Battle of Kulikovo,' 1850; 'Napoleon Crossing the Alps'; 'Marshal Ney supporting the Rearguard in Russia,' 1855; 'Storming of the Malakoff,' 1857-59.

Ywrieff, Ywiev, or Ywryev (formerly Dorpat), a tn. of Livonia, Russia, on R. Embach, 165 m. S.W. of St. Peters-

R. Embach, 165 m. S.W. of St. Petersburg. It is a picturesque town, with gardens occupying the old fortifications, and has a ruined cathedral and a celebrated university, founded in 1632 by Gustavus Adolphus. There Peaceful in disposition.

Yunnan, the most south-westerly is a trading centre. It was one of the Z, like Y, was only found in the Zagazig, a tn. of Lower Egypt, cap, later Roman alphabet, from which it prov. of Charkieh, 50 m. N.E. of Cairo, has been transferred to a busy and important market of W. Europe. In the

letters it occupied the

the sixth being the property of the subsequently disused Vau or F.

Zabern (Fr. Saverne), a tn. of clever picture control and the R. Zorn, works are Rostarler, a tale, and 20 m. N.W. of Strassburg, manufactured works are Rostarler, a tale, and 20 m. N.W. of Strassburg, manufactured works are Rostarler, a tale, and 20 m. N.W. of Strassburg, manufactured works are Rostarler, a tale, and 20 m. N.W. of Strassburg, manufactured works would not be stored to the strain of the st tures tools, woollen cloth, and hosiery. essays.

Pop. 9153.

are extensive cattle ranches. Pop. sus.

Zacharias, St. (d. 752), Pope, of house the reigning dynasty of Buden Greek parentage; he succeeded Greek jackended. gory III. as pope, and in that capacity exercised considerable political influence. He visited Luitprand, King of the Lombards, in 743, and confirmed Semipalatinsk, Russian Central Asia, Pepin the Short in his usurpation of situated between the Tarbagatal and

naval licutenant, astronomer, and Hebraist, who started a prophetic astrological almanae (1830) which attained great popularity.

Zadonsk, a tn. in the gov. and 60 m. N.W. of Voronezh, Russia, on the N.N.W. of

R. Don. Pop. 8300.

Zaffarines, Zafarani Is., or Chaffarinas, three small islands belonging

S.E. of the city of Badajoz, Spain, cultivated. has a ruined castle. Pop. 6200.

a busy and important market and is a centre for the cotton Pop. 34,999.

Zagoskin, Mikhail Nikolaivitch subsequently disused vau or F.
Zaandam, or Saardam, a tn. in the prov. of N. Holland, the Netherlands, on the Zaan, 5 m. N.W. of Amsterdam. It has a great number of sawdam. It has a great number of sawdam. It has a great number of sawdam wind-mills, and manufactures paper, glue, tobacco, and dyes. In 1697 Peter the Great worked in the of historical fiction. His most popushipbuilding yards here. Pop. 24,579. (1789-1852), a Russian writer, was

Zagreb, Croatia, see Agram.

Zabians and Zabism, see Sabeans, Zagreus (Zaypeix), a surmane of Zabrze, a tn. of Silesia, Prussia, S m. the mystic Dionysus (Adorros More, glass, chemical, and oil form of a dragon by Zeus and Perseworks, and breweries. Pop. 63,225. phone, but was torn to pieces by the Zacatecas: 1. A state of Mexico; Titans. Thereupon Athena bore his constant of the pieces by the death of the pieces by the pieces by the pieces by the death of the pieces by the pieces area 24,757 sq. m. Is rich in silver heart to Zeus who swallowed it and and other minerals. In the N. and E. became the father of the new Diony-

475,863. 2. A city, cap. of foregoing, a centre for silver mining. Has a cathedral, a large college, and a mint. castle, which was the ancient seat of Pop. 25,905.

Zaila, see Zuyla

Vatican Library and translated the Black Irtish and empties itself into the Irtish. Area about 700 sq. m. Zakopano, a vil., Galicio, Austria, Zakiel, the pseudonym of Richard on the Hungarian frontier, 50 m. S. James Morrison (1794-1874), a retired of Cracow, has fron mines. Pop. 7600.

Zalous (#. 7th century B.C.), the carliest Greek legislator, who said he had received his code by revelation from Minerva. He settled in Locri Epizephyrii, S. Italy.

Zama, a tn. in Numidia, N. Africa, 70 m. S.W. of Carthage, was the scene of Sciplo's victory over Hannibal (201 B.C.) which ended the Second Punic War.

Zaffre, a crude oxide of cobalt obtained by heating the ore, which is used in the preparation of smalt.

Zafra, a tn. in the provest of cold of the control of smalt. Zafra, a tn. in the prov. of and 37m. | sugar-cane, rice, and tobacco are Pop. 105,000. capital is Iba.

Zambesi, a river of S. Africa, ex-; by the natives of S.E. Africa for tending mainly through Rhodesia and food. Portuguese E. Africa, about lat. 16°S. Its length of about 2200 m. is only exceeded in Africa by the Nile, Congo, and Niger; its drainage area is about 520,000 sq. m. It rises at a height of about 5000 ft. in N.W. Rhodesia, near the borders of Belgian Congo, some 300 m. E. of Lake Dibolo, whose waters it receives. Its general course is S.E. through the Baroki Valley to the Victoria Falls, where the Cape to Cairo railway crosses at Livingstone by a single span bridge over the gorge below the falls. These have a breadth of over a mile, and a height of 400 ft., the greatest in the world, though the volume of water is small, since the river has passed only through regions of deficient rainfall. Below the falls the gorge follows a zig-zag course, due to the faulting of the lava rock which the river is eroding. From here the was appointed Minister of Public river bends N.E. and E. nearly to Works, and in 1878 Minister of the Interpretation of the delta, situated some 200 m. N.E. of Sofala in the Mozambique cato. He again entered political life, Channel. Its volume is largely interpretational material of the Council (1881-83 and 1887-91), and president waters of Lake Nyasa. The delta has seven principal chappels of which the Tander Institute, a gymnasium seven principal channels, of which the R. Chinde is the most important. The river is navigable for 120 m. from its mouth, though with difficulty in the dry season, and for special river steamers (stern-wheel) up to Tete, and on the R. Shiré to Chiromo. Below Tete the Lupala Gorge has a width of about 200 yds. and a very strong current. In general, on account of the poor rainfall and the terrace formation which characterises the whole continent of Africa, the river is only particular in fault to detections and navigable in isolated stretches and then precariously. Livingstone was the first explorer of the upper river between 1851 and 1853; he dis-covered the Victoria Falls (1855) during his descent of the river to its mouth.

Zambesia, an administrative dist. in Portuguese E. Africa or Mozam-bique, lying in the lower valley of the R. Zambesi. The chief products of the soil are rubber and sugar; some cold is found. The capital of the

province is Quilimane.

Zamboanga: 1. A dist. in the W. of Mindanao, Philippines, with an area of 3358 sq. m. Rice, tobacco. sugar-cane, coffee, copra, hemp, etc., are cultivated. Pop. 45,000. 2. Cap. of above. It is an old Spanish

Zamindar, see ZEMINDAR.

Zamora: 1. A prov. in Leon, Spain, on the Portuguese frontier. Area 4097 sq. m. It is watered by the Douro and its tributaries. Pop. 272,143. 2. City and cap. of above prov., on the Douro, 40 m. N.N.W. of Salamanca. It has a late Roman-esque cathedral, and manufs. wines, woollens, and linen. Pop. 16,283. 3. A tn. in Michoacan state, Mexico, on the Zamora R., 200 m. W.N.W. of Mexico City. Pop. 10,000. Zamose, a fort. tn. of Russian Poland in the grey and to m. S. F. of

Zamose, a fort. on of fitting Poland, in the gov. and 45 m. S.E. of Lublin, on the Wieprz. Pop. 12.000.
Zanardelli, Giuseppe (1826-1903).

an Italian statesman, born at Brescia. He studied law at the University of Pavia, and afterwards served in the wars of 1846-49 and 1859. In 1876 he was appointed Minister of Public Works, and in 1878 Minister of the Interior. He soon, however, retired to the public where he published to the

Institute, Zander gymnasium established for the purpose of curing diseases by body movements, parti-cularly those aided or initiated by mechanical appliances. The system was elaborated by Dr. Gustaf Zander in 1857, and in 1865 the Z. I. at Stockholm was established under his supervision. Since then other such institutes have been established in Germany and Sweden, and in 1911 a similar gymnasium was provided in Sheffield through the generosity of Mr. Edgar Allen. The germ of this method of therapeutics is to be found in the medical gymnastic system invented by Henrik Ling, of Stockholm, about 1810. Ling, after having suffered from rheumatism and general debility for several years, found himself perfectly cured through the exercise obtained while acting After teacher of fencing in Lund. going through the orthodox medical training he gave his life to the work of demonstrating the merits of body movements in the cure of disease. The Zander system regulates the body movements by employing suitable apparatus. Thus a completelyequipped Z. I. contains machines for active movements, that is, machines of above. It is an old Spanish fortress, now an open port with naval restations. Pop. 3500.

Zamenhof, Lazarus Ludovic (b. 1859), inventor of Esperanto (q.r.).

Zamia, a genus of dwarf trees forder Cycadaceæ). Z. caffra is the bread tree, its pith being used

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Zandvoort, a scaside resort, N. Holland prov., Netherlands, on the North Sea, 6 m. by rail W.S.W. of Haarlem. Pop. 3794.

Zanella, Giacomo (1820-88), กก Italian poet and priest, born at Chiampo, near Vicenza. He was pro-fessor of Italian literature at the University of Padua from 1865-76. His chief work was a history of Italian literature during the last two centuries.

Zanesville, a city of U.S.A., cap. of Muskingum co., Ohio, on R. Muskingum. Has rail connections v Columbus. Manufactures bri tiles, and machinery, and is rar Pop. (1910)

growing in importance. Pop. (1910) 28,026. Zangwill, Israel (b. 1864), a man of letters, began life as a teacher and then became a journalist, since when he has written essays, novels, and plays. His first book, an amusing phantasy, The Premier and the phantasy, The Premier and the Painter, appeared in 1888, and was followed by The Bachelors' Club (1891) and The Old Maids' Club (1892), clever works in which, however, the humour is overstrained. Z.'s best book, The Children of the Ghetto (1892), is, as the title denotes, a study of Jewish life in England, and it is not only an interesting novel, but a valuable contribution to social history. Among his other books are: The Master, 1895; Dreamers of the Ghetlo, 1895; The Manile of Elijah, 1900; and Ghetlo Comedics, 1893.

Zante (ancient Zacynthus): 1. One of the Ionian Is., E. of Greece, 8 m.

S. of Cephalonia; produces pitch, oil. and gypsum. Fruit is grown oil, and gypsum. Fruit is grown in large quantities. Earthquakes are of frequent occurrence. Area 277 sq. m. Pop. 42,500. 2. Cap. of Zanto Is., is a scaport on the E. coast, and exports currants, soap, olives, and fruit. Pop. 16,000.

1. Zanzibar: sultanate Eastern Africa, under British protection since 1890, comprising the two islands of Z. and Pemba. Area of the suitanate is 1020 sq. m. The reign ing sultan (b. 1906) succeeded on his father's abdication in 1911. chief exports are cloves, ivery, copra, and rice. The exports in 1911 were valued at £1,173,139, and the imports at £1,179,699. Pop. 198,914. and fies.

Zaraishan, see Zharaishan, see Zhar Pemba: the Space Island of Eastern Africa, tribut 1913, 2, An island of Eastern Africa, tribut in the Indian Ocean, forming, with chief in the Indian Ocean, forming, with chief Pemba, the sultanate of Z. Area 640 The sq. m. The soil is rich, the chief product was being cloves. There are about 300 resi- 340,000.

apparatus for measuring the effects dent Europeans, the rest of the popu-produced by any mechanical mode of lation being made up of heterogeneous treatment.

African tribes. The chief towns are Zanzibar (capital), Tabora, Nyangwe, and Ujiji. Pop. 115,477. 3. Cap. of the above island, situated on its W. coast, and the residence of the British minister of the sultanate of the same name. It was once the greatest slave market in the world. It has an extensive trade in ivory. copal, caoutchoue, cloves, and copper ware. There are French and English hospitals, missions, barracks, etc. Pop. 35,000. See S. Playne's, Brilish East Africa, 1910.

Zaparos, a tribe of S. American well in the country Pastaza and Napo. aracteristics of the

Mongolic race and are polygamists. Zapatoca, a tn. in Santander, Colombia, on the Sagamozo R., 160 m. N.N.E. of Bogotá. Pop. 8000.

Zapolya, or Zapoly, an illustrious Hungarian family of Slavonian origin: Stephen Zapolya (d. 1499), fought as a general under Matthias Corvinus, King of Hungary, in the conquest of Austria, over which he was appointed governor (1483). After the death of Corvinus, he procured the accession of Whadislaw II. His daughter, Barbara, by marriage with Sigismund I., became Queen of Poland. His son, Johann I. (1487-1510), preclaimed himself King of Hungary (1526) in opposition to Ferdinand of Austria. The Trusts befored him is bi-Austria. The Turks helped him in his struggle against Ferdinand, who finally reduced his territories to Transylvania. Johann II. (1510-71), son of the preceding, inherited the kingdom of Transylvania and parts of Eastern Hungary.

Zaporogians, see Cossacks. Zapotlan, or Zapotlan el Grande, s tn. in Jalisco state, Mexico, 70 m. S. by W. of Guadalajara. Pop. about

18,000.

Zara (Roman Indera), cap. of Dal-matia, Austria, on the Adriatic Sea-52 m. S.E. of Trieste; manufs maraschino, glass, oil, flour, and wax It is a Roman Catholic and Orthodox ecclesiastical see, and has severa notable churches, the cathedral dat ing from 1202. The town was a ing from 1202. Roman colony; was purchased from Hungary by Venice in 1409, and passed to Austrian 1792, Pop. 36,609. Zarafshan, see Zerafshan.

German critic, born at Zahrenstorf in Mecklenburg-Schwerin. He entered upon a journalistic career, and in 1858 was appointed professor at the Leipzig University. He edited the Nibelungenlied, Brandt's Narren-Nibelungentied, Brandt's Narren-schiff, and the Old Saxon poem called Heliand, and was an authority on German legends.

Zarskoe, see TSARSKOE SELO.

Zarskoe, eee Tsarskoe Sello.
Zaruma, a tn. in the dept. of El
Oro, Ecuador, W. of the Andes on the
Tumbez. Gold and quicksliver are
found. Pop. about 6500.
Zaslavi, a tn. in Volhynia, Russia,

on the Goryn, 80 m. S.W. of Jitomir.

Pon. 12,700. Zbaraz, a tn. in Galicia, Austria-Hungary, 12 in. N.E. of Tarnopol. Pop. 9911.

Zea, see CEOS. Zea Mays, see MAIZE. Zea, Francisco Antonio (1770-1822). Columbian statesman, born at Antioquia. He became professor of natural science at Madrid (1805). He ioined Bolivar in S. America (1815) and was appointed vice-president of Colombia (1819). In 1820 he was sent on a mission to England and died at Bath. Zealand, see ZEELAND.

Zealots (Gk. ζηλωτής, an enthusiast, from ζέτιν, to boil), a loosely organised party among the Jews at the time of Christ. They carried on the Maccabean tradition, and were uncompromising in their resistance to all Roman authority. They aimed at the complete political emancipation of Judga, but were never able to carry on more than a desultory warfare. It was their fanaticism and vigour that brought about the rising which culminated in the Fall of To this party belonged Jerusalem. Simon, one of the Twelve Apostles.

Zebid (ancient Sabea Regia), a fort. tn. in Yemen, Arabia, 60 m. N. of Mocha. It is the seat of a Sunnite

college. Pop. about 5500.

Zebra, a group of three equine species confined to the African con-They are the true or mounthent. They are the true or mountain Z. (Equus zebra), Grevy's Z. (E. grevyi), and Burchell's Z. (E. burchelli). Until the middle of the 19th century a fourth species, the Quagga, existed, but this is now extinct. The mountain Z. has short extinct. The mountain Z. has short clean legs, hard, well-shaped hoofs, and long ears. Its body colouring is slivery white with black or dark brown markings. It is a rapidly vanishing species. Grevy's Z. is a Jerusalem was again taken. Z.'s eyes much larger animal and has finer and more numerous black or brown markings on a clear white ground residue. Tedlitz. Joseph Christian, Baron Zedlitz. Joseph Christian, Baron markings on a clear white ground. Burchell's Z. is intermediate in size,

Zarncke, Friedrich (1825-91), a differently arranged. These, when erman critic, born at Zahrenstorf in broken-in young, lend themselves more readily to domestication than the other species.

Zedlitz

Zebu, or *Bos indicus*, an ox which exists only in a domesticated state in Asia. It is characterised chiefly by its large hump, or sometimes two humps, over the withers and by a greatly de-Its colour varies veloped dewlap. Its colour varies from ashen grey to pure white, and white bulls, known as Brahmin bulls. are held sacred by the Hinduand allowed to wander at will. They vary greatly in size, and in India are used as beasts of burden

and draught.

Zechariah, the eleventh of the minor prophets; was a contemporary of Haggai, whom he supported in urging the people to rebuild the Temple. The book which bears his Temple. name is clearly divided into two parts of very dissimilar character. The first part, consisting of chs. i.-viii.. is universally regarded as the original work of Z., and as belonging to the years 520 and 518 B.C., the second and fourth years of Darius Hystaspes. The whole of the second part of the book (chs. ix. xiv.) is placed by most critics after the Exile. It is possible that these six chapters come from the same unknown hand, having been written at different times and in view of very different circumstances. Some critics, however, see evidence of four different hands. It is impossible here to give a detailed analysis of either of the two big divisions (see Temple Dictionary of the Bible), but we may note the large outlook which the first section shows and its great emphasis on the necessity of moral obedience as of supreme importance in the service of Yahweh.

Zechstein, a German geological term applied to the Upper Permian. in the various strata of which many fossils are found. In some parts of N. Germany the Z. bears valuable deposits of kainite, gypsum, rock salt, and carnalite. The Z. overlies the Kupferscheifer, which consists of a bed of black bituminous shale. containing the fossils of many kinds of fish, leaves, and other organic

remains.

Zedekiah, the last king of Judah and Jerusalem (597-586B.C.) was originally named Mattamiah. He was set on the throne as vassal king by Nebuchadnez-zar, when his nephew Jehoiakim was

Zedlitz, Joseph Christian, Baron (1790-1862), a German poet, born at and its black or brown stripings are Johannisberg in Austrian Silesia, and

Zedoary, or Curcuma redoaria, an 1872. His chief work was: Asiatic plant, the aromatic roots or Geschiede der Griechischen

mining district.

rapidly growing.

Zeeland, the southernmost prov. of the Netherlands, has an area of 690 sq. m. Besides the mainland, five islands are included in the province. Surface very flat and often below sea-level. Climate very damp. Corn, butter,

scopie, vol. ii.

ver, and gold are mined. (excluding blacks).

agricultural implements. Pop. 10.000. Zeitz, a tn. of Prussia, 25 m. S.S.W.

served in the army and in the Austral philosopher, born at Kleintrian foreign office. He wrote dramas bottwar in Würtembers. He was and narrative verse, his best known works being: Kerker und Krone; and at Marburg in 1849, but forsook Slern ron Serilla; Allnordische theology for historical work, and braulein.

Sign of Current Section 2018 1847. Wis chief work was the first of the server are the section work was the server are the server rhizomes of which are employed in sophic (5th ed.), 1892, translated into medicine. It is sometimes grown in English as Socretes and the Scendic the stovehouse.

Schools, but he also wrote Schools.

Teebrügge, a seaport, W. Flanders Epicurans, and Scritics; Plado end prov., Belgium, 7 m. N. of Bruges, the Older Academy; The Pre-Socratic whose port it is. It has a fine breakwater, and a ship canal (7 m. long), connecting it with Bruges, which was opened by King Leopold in 1907.

Zeehan, a tn. of Tagmania, 90 m. high caste Hindu family. The Z. is E.N.E. of Hobart, on the r. b. of the lat the back of the house and over-Badger. It is the centre of a silvery looks the square or inner court. As mining district. Pop. 5500, and a rule each women has a small room. Pop. 5500, and a rule each woman has a small room to herself, on the second floor, the offices and kitchen being on the ground floor. No weman may go outside the Z., nor may she visit the men's quarters, as it is considered a discrace for a Hindu woman to be

Climate very damp. Corn, butter, cheeseare produced and cattle reared. Chief towns, Middleburg (cap.) and of which there is at present uncertushing. Pop. 232,515.

Zeeman's Effect, a modification of the lines of the spectrum due to the of the Parses were written, but presence of a strong magnetic field, some hold that the word means the H. Kayser, Handbuch der Spectrois a collection of the ancient religious Zernst, a tn. of Transvaal, S. lore of the Parses, and its author-Africa, 125 m. W. of Pretoria, on a ship is traditionally ascribed to right bank tributary of the Marico. Zoroaster. It falls, however, into two It is in the centre of a district of great main divisions, the Old Avesta and fertility and mineral wealth. Wheat the New Avesta, which divide into a and grapes are grown, and lead, sill-number of sub-sections. It is very ver, and gold are mined. Pop. 2000 diffuse, and is full of repetitions and (excluding blacks).

Zehlendorf, a tn. of Brandenburg, evil. The critical study of these Prussia, 8 m. S.W. of Berlin. Pop. works has not yet been carried far. Zeitun, a tn. in the vilayet of Aleppo, [91) and a translation in the series of Syria, 22 m. N.W. of Marash, on Sacred Books of the Eas. See also the E. slope of Mt. Zeitun. Manufs. E. G. Browne's Literary History of acricultural implements. Pop. 10,000. Person, 1903.

Zeitz, a tn. of Prussia, 25 m. 3.2....

Ine terminates in the nature of the nature of Leipzig. Has a fine cathedral, line terminates in the nature of allitude.

Pop. 32,972. Manufactures cotton goods, macainery, and earthenware. Wine and is therefore an important point or spirits are also produced. Pop. 32,972. reference in astronomy; Z. distance spirits are also produced. Pop. 32,972. reference in astronomy; Z. distance the Le coast, before 1893 a part of Z. and the complement of altitude, the Mosquito territory. The soverthe district was confirmed by treaty with Great Britain in 1905. Pop. 13,906. The Z. telescope, now super-seled by the transit instrument, was instructed to measuring the difference between the Z. distances of a pair of Steven the Z. distances of a pair of Steven the Z. distances of a pair of the Z. distances of a pair of the Steven the Z. distances of a pair of the Z. distances of a pair of the Steven the Z. distances of a pair of the Z. distances cotton and sail-cloth. Pop. 14,200.

Zell, or Zelle (Prussia). see Chille.

Zella, a tn., Saxe-Coburg-Gotha, refex instrument, the star's image Germany, in the Thuringian Forest, is viewed by reflection from a mercury 20 m. S.W. of Gotha. Pop. 5691.

Zeller, Eduard (1814-1908). a Ger-

Zenker, Friedrich Albert von (1825-98), a German physician, studied (from 1843) in Leipzig and Heidel-berg. He became professor of pathological anatomy and general pathology at the medical academy of his native Dresden (1855), and of pathology and pharmacology at Erlangen (1862). In 1860 he discovered trichinosis. With Ziemssen he edited the Klinische Deutsches Archiv für Medizin from 1865. Z. retired in Wenschen.' in Virchow's Archive 1895. Menschen,' in Virchow's Archiv. xviii. 1860; Ueber die Veranderungen der willlrürlichen Muskeln im Typhus, 1864: 'Die Krankheiten des "Osophagus "' in Ziemssen's Handbuch der Pathologie . . . vii., 1877 : Ueber den Custicercus racemosus des Gehirns, 1882.

of the Stoic philosophy, was a native of Citium in Cyprus. He studied philosophy first through the writings of the Socratic philosophers, but later went to Athens where he attached himself to the cynic Crates. but he In opposition to the advice of Crates he studied under Stilpo of the Megaric school, and later under Diodorus Cronus and Philo of the same school. He then proceeded to Xenocrates the Academics. and Polemo, and having thus spent some twenty years in study, opened a school for himself in the 'Painted Porch' Στοὰ Ποικίλη, which, at an earlier time, had been a place in which poets met. Hence his disciples were called Stoics. He was greatly admired by the Athenians as well as by Antigonus Gonatas, king of Macedonia.

Zeno (fl. 500 B.c.), a Greek philo- and was put sopher, a native of Elea in Italy. He of Palmyra, was the favourite disciple of Par- Zenodotus menides, whom he accompanied to Athens, and whose teaching he expounded. He was a lover of freedom. and on his return to Elea joined an unsuccessful conspiracy against the tyrant Nearchus. See Zeller's Pre-Socratic Philosophy, and Mullach's Fragmenta

Zeno, Emperor of the East 474-491, was a native of Isauria. He was com: Turks here (1697). Pop. about 28,590. pelled to leave Constantinople in 475 Zeolites, a family of minerals con-

of Khamseh prov., on the Zenjan, the usurper Odoacer. Z. published 75 m. S.W. of Resht. Pop. 25,000. the *Henoticon* (ἐνοτικόν), or instruZenker, Friedrich Albert von (1825- ment of union, which was signed by all the bishops of the East under his reign, and that of Anastasius.

Zeno, Apostolo (1668-1750), an Italian dramatist and literary his-torian, born at Venice. He was one of the founders of the critical periodical Giornale de' Letterati d'Italia, and made his reputation in Italian literature by libretti for the musical drama: indeed he has been called the father of Italian opera. For many years he was the chief dramatic poet of Italy, and acted as court poet and historiographer to the emperor Charles V. He wrote Observations on the Italian

volumes. Zeno, Niccolo (1340-91), a Venetian explorer: with his brother, Antonio, made various voyages of discovery; Zeno (c. 340-270 B.C.), the founder indeed, the discovery of America. prior to the voyage of Columbus, has been attributed to them. See Major, The Voyages of Niccolo and Antonio Zeno (Hakluyt Society, 1873), and Fiske, The Discovery of America (red i) 1899 Fiske, The (vol. i.) 1892.

Historians (2 vols.); and his dramatic works were printed in 1744 in eleven

Zenobia, Queen of Palmyra (Tod-mor in the wilderness). After the Odenathus death of her husband, (266 A.D.), she assumed the imperial diadem, as regent for her sons. She sought to include all Syria, Asia, and Egypt within the limits of her sway, and to make good the title which she claimed of Queen of the East. She was defeated by Aurelian, taken prisoner on the capture of Palmyra (273), and carried to Rome. Her life was spared by Aurelian, and she passed the remainder of her years with her sons in the vicinity of Tibur (Tivoli). Longinus lived at her court. and was put to death on the capture

Zenodotus (Zηνόζοτος) (fl. c. B.C.), a Greek grammarian, was a native of Ephesus. He was the first Reviser (Διορθητής) of Homer, and the first superintendent of the great library at Alexandria.

Zenta, a tn. of Bacs-Bodrog co., Hungary, on the Theiss, 33 m. S. of Philosophorum Graco-Szegedin. Agriculture, fishing, and cattle-rearing are the chief induseror of the East 474-491, tries. Prince Eugene defeated the

in consequence of a revolt in favour sisting mainly of hydrous silicates of in consequence of a revolt in favour sisting mainly of hydrous silicates of of his brother Basiliscus, but re-lime, soda, and alumina, which have turned the following year. His whole reign was disturbed by revolts and foreign wars, and in 487, when the secondary products, they occur in Gothic king took up arms and cavities and veins, and are common threatened Constantinople. Z., to save himself and his capital, gave him present a finely fibrous structure. permission to invade Italy and expell Among the more common zeolites are analcite, natrolite, stilbite, prehnite, whales, found in the Eocene and and laumontite. They have a specific Miocene strata of N. America, Europe, gravity of about 2-3, and a hard-

ness of from 3.5.5.

Zephaniah, the ninth of the minor prophets, has left a short but most valuable prophecy. He prophesied in the reign of Josiah, king of Judah (639-608 B.C.), almost certainly before the discovery of the Book of the Law. His book has two main divisions (1) Chapters i. 2 to iii. S, containing a warning of judgment; (2) iii. 9-20, giving a promise of salvation.

Zephyrus (Zédvpos), the personification of the West wind, was the son of Astreus and Bos. He was the father of the horses Xanthus and Balius by the Harpy Podarge, and the husband of Chloris, by whom he

begot Carpus.

Zeppelin, Ferdinand, Count von, a German army officer and eronaut, born at Constance in 1838. He studied at the Polytechnik, Stuttgart, and at the Kriegsschule, Ludwigsburg, afterwards proceeding to Tübingen University. He took part in the American War of Sccession, and also served in the Francoand also served in the Franco-German War (1870), but from 1897-1900 was occupied in

of his first airship or of rigid type, making

Several of its improved in 1900. successors came to grief, but on the whole the rigid dirigible has made the most important progress and that chiefly owing to Z. The last Zeppelin, built in 1913, and acquired by the German navy, had a length of 525 ft. and a volume of 776,000 cubit ft., and was capable of a speed of 52 m. an hour. The latest military Zeppelin also carries a machine gun. Z. started a passenger air service in 1910.

Zerafshan, a river of Russian Central Asia, which rises in E. Samar-Russian kand at the foot of a glacier of the Passing through Lake it enters Bokhara and Alai Mts. Iskander, loses itself in the sandy basin of the Amu-Darya. Length about 450 m.

Zerbst, a tn., Anhalt, Germany, on the Nuthe, 22 m. S.E. of Magdeburg; has manufs of gold and silver goods, silk, cloth, leather, soap, and chemi-cals. Parts of the ancient walls

remain. Pop. 19,209.
Zermatt, a vil., Valais canton,
Switzerland, at the head of the Visp Valley (5315 ft.), and at the foot of the Matterhorn, 22 m. by rail, from Visp in the Rhone Valley; is a favourite tourist resort. Pop. 800.

Zero (Arabic cafra, to be empty), a term applied in mathematics to O, or to quantity so small, as to be negligible, and in physics to a point which serves as the base of measurements.

and Egypt. They were upwards of 50 ft. long, and the skull, which had powerful toothed jaws, was long and narrow. The brain cavity was smaller than that of existing whales. fact that the teeth were implanted in sockets enabled Professor Owen to prove that the first discovered remains were not those of an enormous reptile, as was supposed. See Calalogue of the Terliary Vertebrata of the Fayum, Egypt (Brit. Mus. Nat. Hist.)

Zeugma (Gk. Zeryna, a yoking), a figure of speech in which a verb or adjective is used with two nouns. though strictly referring only to one.

Zeulenroda, a tn., in the principality of Reuss-the-Elder, Germany, 35 m. N. of Hof, manufs, hostery, textiles, and machinery. Pop. 10,365.

Zeus, sec JUPITER.

Zeuss, Johann Kaspar (1806-56), a German philologist, born at Vogtendorf (Bavaria). Studied at Bambers and Munich. Took up the study of comparative philology. Wrote (1837) The Germans and the Neighbouring Races and other works. other works. His great is his Cellic Grammar ork of vast and pains-

tion. Zeuxippus, a Greek philosopher. He was one of the leaders of the New Academy, which sought after the death of Pyrrho to carry on the

teachings of the Pyrrhonic scepticism.

Zouxis (fl. 425-400 n.c.), a celebrated Greek painter, born at Heraclea. He belonged to the Ionic school of art and apparently drew his in-spiration from Apollodorus. Pliny, Lucian, and Cicero tell many curious anecdotes concerning him. The chief works ascribed to Z. were an ' Erosat Athens,' an 'Infant Hercules,' and Jupiter enthroned.

Zeyla, or Zaila, a tn. in Somaliland, Africa, on the Gulf of Aden; E. Africa, on the Gain of Coupled by the British since 1881, It exports mother-of-pearl, coffee, and hides, but has lost its former commercial prosperity. Pop. about 5000.

Zeist, or Zeyst, a vil. in the prov. of Utrecht Netherlands, with manufs. of porcelain-stoves, candles, soap, etc. Pop. 12,806.
Zgierz, or Zgerl, a th. of Prussian

Poland, in the gov. of Piotrkow, 6 m. N.N.W. of Lodz. Pop. 19,000.

Zheleznovedsk, a tn. in the prov. of Terek, N. Caucasus, Russia, visited as a health resort on account of its iron springs.

Zhitomir (Russin), see Jitomin. Zhob, a river of N.E. Raluchian. Rises in the Khand and stan. Zouglodon, a genus of extinct runs E. to Gonal, where it turns N.N.E.

Zinc 631

and joins the Goumal. It was expected in painting pictures of plored in 1864 by Lieutenant Wahab, scenery and of classical mythology. who describes the valley as an allu-

who describes the valley as an alluvial plain of fair fertility. It is of strategical importance.

Ziani, a noted Venetian family, of which the chief members were: Sebastiano (d. 1179), doge of Venice from 1172, who founded the ceremony of casting a ring into the desiration of which is a saw whole of the warrise. Adriatic as a symbol of the marriage quered the Greeks.

Zibet, see CIVET.

Zichy, Eugen, Count (b. 1837). a Hungarian traveller and collector, born at Zichy-falva. He explored the Caucasus and Central Asia, and subsequently published Voyages au Caucase (1897).

Ziegenbalg, Bartholomew (1683-1719), a German missionary to India. born at Pulsnitz in Lusatia, and died at Tranquebar, S. India. He trans-lated the Bible into Tamil, and wrote a Grammatica Damulica. See Halle Reports, edited by G. A. Francke.

Ziegenhals, a tn. in Silesia, Prussia. 31 m. S.W. of Oppeln, with manufs. of

paper and gloves. Pop. 978.

Zielenzig, a fort. tn. in the prov. of

Zielenzig, a lort. in. in the prov. of Brandenburg, Prussia, 26 in. E.N.E. of Frankfort-on-Oder. Pop. 5704.
Zierikzee, a seaport in the prov. of Zealand, Netherlands, the chief town of Schouwen Is., with shipbuilding yards and good fisheries. It played an important part in the Hanseatic League. Pop. 6808.

Zieten, Hans Joachim von (1699-1786), a Prussian general, born at Wustrau. He joined a cavalry regiment, and served in the Silesian wars and in the Seven Years' War with See Life great distinction.

Winter (1885). Zilah, or Zillenmarkt, a tn. Transylvania, in the co. of Szilagy,

Hungary, Pop. 7600.

Zilleh, or Zile, a vilayet of Sivas in Asia Minor. It was from here that Cæsar conquered the Pharnaces after having made his famous boast, Veni.

having made his tamous bouse, i ent, vidi, vici (47 B.C.). Pop. 20,000.

Zillerthal, a beautiful Alpine valley of the Tyrol, 25 m. E. of Innsbruck. It is watered by the Ziller, a trib. of the Inn. A number of the inhabitants fled from religious persecution to Prussia in 1837.

Zimbabwe, the site of some ruins in S. Rhodesia, S. Africa, 120 m. E. of Sofala. Discovered by Renders, 1868; described by Mauch, 1871. They present the general appearance of a fortress, and were probably erected either by Arabs or by one of

Zimmermann, Johann Georg, Baron von (1728-95), a philosophical writer and physician, born at Brugg. He acquired considerable fame by his book, On Soliltude, which was full of a sort of sentimental charm that was more appreciated in his day than in ours. His reputation as physician and philosopher gained him the of Venice with the sea; and Pietro friendship of Frederick the Great, (d. 1229), doge from 1205, who con-whom he attended in his last illness, and by George III., who made him his private physician at Hanover.

Zimmermann, Reinhard Sebastian (1815-93), a Swiss genre painter, born at Hagenau, Switzerland. He studied at Munich and afterwards in Paris. at Aumen and atterwards in Paris, ultimately settling in the former town, where he exhibited 'The Three Magi' in 1850. Other pictures by him are: 'An Interrupted Game of Cards' and 'Scene in a Village Inn.' He was also the author of Erinnerungen eines alten Malers. 1884.

Zinc (Zn, 65.4), a metallic element stated to be found in the uncombined condition, but generally met with in combination as the carbonate (calamine), ZnCo2, and the sulphide (zinc blende), ZnS. It also occurs as silicate (hemimorphite), ZnSiO₂ + H₂O₃ and as red zinc ore, ZnO. The extraction of the metal from its ores is carried out in two stages, the oxide being first formed and in the second stage this is reduced by carbon. Blende is the ore generally employed, and this is converted to oxide by roasting in air. The crude oxide is mixed with coal or coke and strongly heated by gas-fired furnaces, in clay retorts or muffles, and the zinc vapour condensed in an iron box (Silesian process). In the Belgian process the mixture is heated in a horizontal fireclay tube connected by a conical clay tube to a sheet iron condenser. The crude zinc is melted in a reverberatory crude zinc is metted in a reveroeratory furnace and further purified by distillation. Zinc is a bluish-white brittle metal (sp. gr. 7, melting-point 430°, boiling-point 930°) which is malleable between 100° and 150° C. At 300° C. it can be powdered in a mortar. It is permanent in air at ordinary temperature, and is used ordinary temperature, and is used for galvanising iron for roofing purposes, etc. A number of alloys are formed by zinc with other metals, e.g., brass (copper and zinc), bronze (copper, tin, and zinc), etc. Zinc burns in air, forming the oxide, ZnO (zinc white). The oxide is white at ordinary temperature, but becomes yellow on of a fortress, and were probably heating. It is a basic oxide, and the erected either by Arabs or by one of the Bantu races.

Zimmermann, Albert (1808-88), a is obtained by solution of the metal German painter, born at Zittau. He or oxide in sulphuric acid, or is made

on the large scale by roasting zinc hard (hardness 7.5, sp. gr. 4.7). The blende in air. The sulphate crystal-lises from water, forming colourless rhombic prisms of the formula are called 'hyacinths.' ZnsO₄7H₂O isomorphous with mass resium sulphate (Epsom salts). It has a metallic, astringent taste, is poisonous, and is used as an emetic. Zinc chloride is formed by dissolving amorphous, the former variety returned to metal or oxide in hydrochloric quiring a high temperature for its ZnSO.7H.O isomorphous with magnesium sulphate (Epsom salts). It the metal or oxide in hydrochloric acid, and boiling the solution down acid, and boiling the solution down combustion, while the latter burns until it solidifies on cooling. It is a when gently heated in air. The metal white deliquescent substance, and is obtained by heating the fluorowhite deliquescent substance, made into a paste with zine oxide made into a paste with zine oxide. This rapidly sets to a hard mass. This mixture is used in dentistry as a filling. A solution of the chloride is used as a flux in soldering.

Zincke, Christian Frederic (1684-1767), a German miniature painter. Coming to England in 1706, he soon won great fame; found a keen patron in George II., and received many commissions from members of the English nobility. Among his minia-tures is one of Prince Charles Edward Stuart, now in the possession of the Earl of Wharncliffe, while the Earl of Wharncliffe, while the National Portrait Gellery also has one of Z.'s works. the

Zincography, see Process Work.
Zinder, or Sinder, a walled th. of
French Sudan (Upper Senegal and
Niger Colony), W. Africa, 350 m.
from Timbuktu, cap. of Damerghu
dist. There is trade in salt, spices, silks, ostrich feathers, etc., and tele-graph communication with Kayes and

monk, born at Meran. He possessed a wide knowledge of German folk-

lore and ancient mythology.

Zinzendorf und Pottendorf, Nikolaus Ludwig, Count von (1700-60), a
German theologian, born at Dresden.

He founded the colony

The founded the colony

The fingers, to form the accompanion of the strings of the method of the played instrument of Bavaria.

for Moravian Brethren

a result was banished (1736-48). He travelled in Europe and America, reviving and organishing the Moravian Church, and wrote the Mandau, 48 m. E.S.E. of Dresden; manufs, linen, damask, woolens, and pottery. Lightle is mined. Pop. 37,084.

Spangenberg (1772-75).

Zitte, Karl Alfred von (1839-1904).

Is obtained by nearing the morppotassium compound with aluminium
or sodium. The normal salts are prepared from the feelily basic tetravalent hydroxide Zr(OH).

Zirknitz, Lake of (ancient Lacus
Lugeus), a lake in Carniola, AustriaHungary, 20 m. S.W. of Lalbach. Its
depth varies from 5 to 18 ft., and its
area from 16 to 20 sg m. according area from 16 to 20 sq. m., according

to the rainfall. Ziska, or Zizka von Troenow, Johann (1360-1424), one of the most celebrated leaders of the Hussites of Bohemia, born near his father's castle of Trocnow. In his youth he was gloomy and fond of solitude, and soon left the court, where he had been a page in the retinue of Wenceslaus of Bohemia. He served for a while in the English army, and later fought in Poland and Hungary. In the uproars that followed the death of Huss he was commander-in-chief of the Hussite army, which position he filled with great success. He was

graph communication with Kayes and Niamey. It is a centre for trade buried at Czaslau.

Siamey. It is a centre for trade buried at Czaslau.

Zither, a stringed musical instrument plucked with a plectrum, which detegraphic (Dec. 1900); Jean, Les Touareg du Sud-Est (1909).

Zingerle, Ignaz Vincenz (1825-81), a German scholar and Benedictine passing over frets, and from twenty word born at More He prospectations of various kinds seven to forty strings of various kinds played as open strings, plucked with

> , and Tyrol, for it is played by is and no lan is without one.

Zion City, see Dowie, John Alix- a German geologist and palacontologist, born at Bahlingen in Baden. His ANDER.
Zipaquira, a tn. in the dept. Cambinamarca, Colombia, 30 m. N.E. of Bogotà, with coal mines.
Pop. 12,000.
Zircon, a mineral of the composition silicate of zirconium, which is found in Norway, Coylon, and the Rollic's expedition to the Libyan Colourless to yellow, which are very captured in State of St geology in 1880. He was also appointed director of the natural history museum there, and from 1899 was president of the Royal Bavarian Academy of Sciences. Z. was regarded as a distinguished authority both on geology and palæontology, and from 1869 till his death was the chief editor of the Palaontographica.

a en Emr representative is called the gopher.

Ziatoust, a tn. in the gov. of Ufa, in E. Russia, 147 m. N.E. of Ufa, with iron foundries and machinery works. Pop. 22,000.

Zloczow, a tn., Galicia, Austria. 45 m. E. of Lemberg, has a mediæval castle and manufactures linen. Pop.

Zmeinogorsk, a tn. in the gov. of Tomsk, Siberia. Some lead and silver

are found. Pop. about 7000. Znaim, a tn. in the prov. of Moravia, Austria-Hungary, on the Thaja, 47 m. N.W. of Vienna. It has the ruins of an old castle and a rathaus. Earthenware is manufactured. The armistice of Z. was concluded here after the battle of Wagram between the French and

Austrians, 1809, Pop. 18,828. Zoan, see TANIS.

Zoan, see TANIS.
Zoar: 1. A vil. in Tuscarawas co.,
Ohio, U.S.A., on the Tuscarawas R.,
14 m. S. of Massillon. A German
socialist society was established here
during 1853-98. Pop. (1910) 182.
2. (called Bela, 'devoured') in Genesis
xiv. and xix.) was situated to the
N.F. of the Dead Sea. Palestine, and N.E. of the Dead Sea, Palestine, and was one of the 'five cities of the plain

spared as a refuge for Lot.

Zodiac, a belt of the celestial sphere 16° wide, extending for 8° on each side of the eclipse. Its antiquity is very great, and the region was noted by different peoples independently, a fact explained by its containing all the known heavenly bodies with proper motions, the sun, moon, and planets. The division into twelve signs, each extending over 30°, served to mark divisions of the year, each being marked by the entry of the sun, in his westward course, into a group of stars. The names have a seasonal Zoe (c. 978-1050), a Byzantine emissinificance interm invival will, myth, chaldeans, introduced in the control of Constantine IX. She married Romanus Aztres. As the sun in spring passes the middle of his ascent he travels through Aries, 7; Taurus, &; and Gemini, 11 respectively; at the solution in Cancer 5, then com-

hunderls (1899). a monumental history of the progress of geological and Virgo, II, these three marking science. He was professor of palacology in the University of Munich in Sagritarius. 1, are then passed 1866, to which was added the chair of through in autumn; Capricornus, V, is occupied at the beginning of winter, Aquarius, , and Pisces, , being traversed in the first part of the ascent. The 'ascending' signs are thus those of winter and spring, the 'descending' those of summer and autumn. The tropics of Cancer and Capricorn are circles of latitude vertically under the sun at the solot now agree with the con-

bearing their names owing to precussion (q.v.). Aries is in Pisces, and so on, the signs 'backing' into constellations to the W.

Zodiacal Light, a faint haze of light extending from the sun along the ecliptic, visible just after sunset or before sunrise as a cone extending above the sun's place into the sky. It is best seen in the evening about the vernal equinox, when the eastern portion of the ecliptic is most nearly perpendicular to the horizon; in the morning at the autumnal equinox, the western portion being then most so inclined. It is for these reasons best seen within the tropics, when it can be observed under favourable conditions right across the sky. Here the counter-glow or gegenschein, a bright patch of a few degrees in diamebright patch of a few degrees in diameter, is seen exactly opposite the sun. The brightness of the Z. L. is sometimes quite conspicuous, though less so than the Milky Way. The spectrum is continuous, without bright lines, but too faint to show dark lines if they should be present. At the horizon it is 20° to 30° broad, and it extends to within about 10° of the zenith. It is most generally supposed to be due to sunject reflected from to be due to sunlight reflected from clouds of meteoric bodies extending in a flat disc round the sun to the plane of the solar equator, and beyond the earth's orbit. It has been photographed by Dr. Wolff and Mr. A. E. Douglass. Another theory considers it as an extension of the corona and of an electrical nature. Dr. Abbott likens it to the nebulosity visible in the Pleiades, and Seiliger considers it possible that Leverrin's observed perturbation of Mercury may be due to the portion within that planet's orbit.

Zoe (c. 975-1050), a Byzantine em-

(1843-91), a German theologian, born at Arensburg in Livonia. He lectured on theology at Göttingen and Strassburg, and wrote Die Papstwahlen (1871) and Johannes Sturm (1887).

Zoffany (or Zoffani), Johann (1735-1810), a German artist, a friend of Sir Joshua Reynolds, born at Ratis-bon. He settled in England (1758), bon. He settled in England (and became an R.A. (1768). works include portraits of Garrick and other famous contemporaries, and Embassy of Hyder Alee to Calcutta.' etc.

Zohar, or Sohar, see CABBALA.

Zoilus, or sound; see Cabana.
Zoilus, a grammarian, was a native of Amphipolis, and flourished in the time of Philip of Macedon. He was celebrated for the asperity with which he assailed Homer, and his name became proverbial for a captious

and malignant critic.

Zola, Emile Edouard Charles Antoine (1840-1902), a celebrated novelist and journalist, born at Paris. His mother was a Frenchwoman, and his father, François Z., a soldier and civil engineer, was of mixed Italian and Greek descent. The death of his father left Z. and his mother in poor circumstances, and but for the help of relatives his educational facilities would have been much less than they were. He early showed his taste for literature by writing when at school a comedy entitled Enfonce le Pion (Making a Fool of the Usher). On leaving school he worked as a clerk at villette, and later in the publishing house of Hachette. He was then writing articles for Le Petit Journal, stories for La Vie Parisienne, and also a series of critical papers for Le Salut Public of Lyons, which were subse-lachette's

and art criticisms for the Evenement; though he was a first-rate journalist of the trenchant and slashing style, he does not seem to have met with any great success in that direction. He therefore turned his attention to novel writing. His novels fall into two well marked classes: first, the frankly sensational and novels of the Rougon-Macquart series, in which, as an exponent of realism, Z. proved himself the master of his age. Perhaps nothing quite so cruelly poignant has ever been written as L'Assommoir, in efforts:

which he graphically describes, without the slightest regard for convenient describes with the slightest regard for convenien

Schackenburg, Jutland, of Italian origin. He finally settled at Rome (1782), where he published his works on numismatics, the chief being Numi class of his works subordinate characterisation. He also made a catalogue of Coptie MSS. See Life by Welcker (1819).

Zoepffel (or Zopffel), Richard Otto (1813). Georgan theologian bord and Vérilé exemplify this paper, of the incurrence of his work. The Rouven-Meet of the specific flowers and the second of Travail and Vérilé exemplify this aspect of his work. The Rougon-Macquart series include, among others, La Fortune des Rougons, Le l'entre de Paris, La Conquête de Plassaus, L'Abbé Mouret, L'Assommoir (which perhaps is better known to English people in the anglicised dramatic version of Drink, in which Charles Warner took the leading rôle), Nana (the narrative of an attractive fille de joie), Pot-Bouille, La Joie de Virre, Germinal, etc., etc. Perhaps his best known work is La Débacle, a story of the bitter humiliation of France in the war of 1870. He carned the undying gratitude of all continental opponents of anti-Semitism and the warm encomiums of the press of the whole civilised world by his challenge to the brated manifesto J'accuse. He died

under strange circumstances in his home, where he was found asphyxi-

ated by the fumes of a charcoal stove.
Zola, or Tola, a tn. on the Upper
Benue, Nigeria. See Tola.
Zolkiow, a tn. in Galicia, Austria-Hungary, with a ruined castle in which John Sobieski of Poland once lived. Pop. 9463.

Zollikofer, Georg Joachim (1730-88), a Swiss preacher, born at St. Gall, in Switzerland. Having studied at Bromen and Utrecht, he ultimately became paster at Leipzig, where he distinguished himself by great purity of character, cloquence, and general abilities. His Devotional Exercises and Sermons have been translated into English.

Zöllner, Johann Karl Friedrich (1834-82), born in Berlin, and became professor of astronomy at Leipzig in 1866. He invented the astrophotometer for determining the brightness of a star by comparison with an 'artificial one' from an oil lamp. His chief work was in photometry and spectrum analysis. His writings include: Photometrische Williams include: Photometrische Williams include: Photometrische Geundzuge des Himmels, 10...

r der Kometen, 1871; and numerous contributions to Pogg. Annalem, and Gesellschaft der Wessimschafter.

Zollverein, the Prussian or German

Z. was the decisive event in German commercial policy, and led directly to German national unity. By it protection was limited to 10 per cent. on manufactures and a uniform duty of 1s. 6d. per cwt. was imposed on all goods. The Anglo-French treaty of 1860, however, resulted in a reversion towards free trade and a treaty with England, as a consequence of which the import duty of 1s. 6d. was abolished together with certain corn and other duties. The word is also now used in a general sense to denote

any customs union. See TARIFF. Zom, Anders (b. 1860), a Swedish artist, and a native of Stockholm, he has lived also in France, England, and America, and has done much remarkable sculpture and painting. But he is mainly known by his etchings, one of which enjoys particular fame being a portrait of Ernest Renan.

Zomba, a tn., the government headquarters, in the Nyasaland Pro-tectorate (formerly British Central Africa), between Blantyre and Lake Nyassa, on Mt. Zomba at an altitude of 3000 ft. Pop. about 80 Europeans.

Zombor, a royal free city of S. Hungary, cap, of Baes co. It is connected by the Franz-Joseph Canal with the Rs. Danube and Theiss, and is an important market. Pop. 30,000.

Zonares, Joannes, a Byzantine historian and theologian of the 12th century, who wrote a Chronicon, or history of the creation down to the year 1118. (See edition by Du Cange, 1686). Originally the private secretary and commander of the imperial guard of Alexius Compenus, he became a monk and died in seclusion

at Mt. Athos.

Zone, geometrically, the portion of the surface of a sphere intercepted between two parallel planes. The earth's climatic Zs. are determined by planes at the Arctic and Antarctic scene of the defeat of the Russians circles, and the tropics of Cancer and by Frederick the Great in 1758. Pop. Capricorn. The resulting Zs. are about 2300. known as the frigid, consisting of the Zoroastria polar caps; the torrid, between the radiation, and are only useful as determining that factor, rather than as giving any clue to actual climate. Actual thermometric observations have led to the continuous have led to the establishment of thermal cones between certain isotherms. The equatorial or tropical

customs duties throughout the vari- from decl. -15° to +45°; Argelander's, ous states joining the union. The of 40,000, from -31° to +80°; Gould's, of 73,160, from -31 to +80°; Gould's, of 73,160, from -23° to -80°. The Internat. Astro. Cat. and the Cape Photograph. Durchmusterung are arranged in Zs. of 1°.

Zone System, a method, largely in vogue on the Continent, of arranging railways in zones from a central point, for the purpose of simplifying railway fares, and for encouraging tourist travel. Thus the fare for any distance up to 10 m. is uniform; from 10 m. to 20 m. an addition is made. and so on: so that a person travelling 20 m. pays the same fare as one travelling only 11 m., and thus travels at his expense. The fares are, however, usually low.

Zoo-Geography, see GEOGRAPHICAL

DISTRIBUTION.

Zoological Society, a society for the promotion of the study of animal life. At its Zoological Gardens (the Zoo),

acres, in Regent's as a magnificent animals admir-

ably housed, and cared for with the utmost skill. Recent improvements (1913) include the Mappin terraces, occupying a quadrant-shaped area, in which the animals are seen in successive tiers of enclosures, and an additional insect house. The Society meets frequently to discuss zoo-logical topics, and publishes quar-terly Proceedings. See Scherren, The Zoological Society of London.

Zoology (from Zwov, an animal, and λόγος, a discourse) literally means a discourse concerning animals, and is the science which teaches the nature, properties, and classification of the subjects of the animal kingdom.

Zoospore, see SPORE.

Zor, a mutessarifat or prov. of Turkey in Asia, lying on both sides of the middle Euphrates. Area 30,110

sq. m. Pop. about 100,000.

Zorndorf, a vil. of Prussia in the prov. of Brandenburg, famous as the scene of the defeat of the Russians

Zoroastrianism, the religion of the Persians, introduced by Zoroaster or troples; the temperate, between the Zarathushtra, who probably lived frigid and the torrid. They merely about 800 B.C. He was either a mark out the incidence of the sun's Mede or a Bactrian, and was evi-Mede or a Bactrian, and was evidently a man of extraordinary personality. Tradition that has gathered around his life, speaks of miraculous signs at his birth, his great wisdom even as a child, whereby he was able to confound the Magi, and of his being borne up to the highest heaven regions are marked by climate and and given the sacred word of life from vegetation arranged in rerical zones between different heights above sealevel. In astronomy, star-catalogues pent in contemplation, and died at are based on Zs.; Bessel's, of 64,000 the age of seventy-seven. The re-The re-

by the Parsees (q.v.). Z. is based on a dual conception of a good principle Ahura Mazda, and an evil one Añgra Mainya, who are in conflict, and must be until the end of the period ordained by Ahura Mazda for the duration of the world. Z. was a practical, ethical doctrine inculcating active charity, kindness to animals, and moral feature worshi v.). Each man,

togeth preventing defilement. Each man, according to Z., has a free will, conscience, and a soul, and a guardian spirit or prototype of himself who dwelt above, and was called a fravashi—being really his own character put into a spiritual body. Having the choice of good and evil, man naturally has to suffer the punishment of sin. After death for three days the soul hovers about its earthly abode. During this time funeral Zouave regiments, formed from rites are performed. Then on the picked veterans from infantry restourth day Sraosha carries the soul ments. fourth day Srasha carries the soul ments.
aloft, demons endeavouring to gain Zoutpa
his burden. The fires lit by the a range of
the same friends of the deceased are supposed to keep these evil spirits in check. Arriving at the bridge between earth and heaven, Milhra and Rashmu cast up the soul's good and bad deeds. Then, having done penance for the bad ones, the soul crosses. If fit for heaven the bridge is broad and easy to cross, but, if not, then the bridge seems but a hair's breadth, and he falls into the gulf beneath. Those seems but a hair s breath. Those falls into the gulf beneath. Those who cross pass into everlasting light. Zoroaster tells of a 'far-off divine event' which will be heralded by signs and wonders. For 3000 years beforehand periods of peace and lowerpowering evil will alternate, and overpowering evil will alternate, and coverpowering evil will alternate, and croatia, and a fearful time ensues until Mazdu and for twelve years defended it against the Turks. In 1565 and in 1566 was besieged, with only savi

will

Sparish poet and dramatist. Born at important positions. His works in Valladolid; studied for the law at clude: Aballino (1794, a navel, later Toledo and Madrid, but soon devoted dramatised); Geschiehle des Freistaats

El Zapatero y el Rey, a comedy, 1840 : and Leyenda del Cid, 1882.

and Legenda det Utd., 1882.

Zosimus (c. 408-450), a Greek his torian, a native of Constantinople. His chief work is Historia Nova, a continuation in six books of the history of Dexippus, extending up to the year 410. It forms a valuable authority for the ith century, and is clear and coness. The author is a clear and concise. The author is a strong opponent of Christianity. See

editions by Mendelssohn (1887). Zouaves, a body of troops in the French army, so called from the Kabyle (Algeria) tribe of Zwawa, from whom General Clausel formed a regiment in 1830. These native troops where the second second control of the second se a regiment in 1830. These native troops were at first ollicered by Frenchmen, and a certain number of Frenchmen were included in the ranks, but this proved unsatisfactory. and the native element gradually died out. The Moorish dress is still maintained, and there are now four

· ·- '), R. Limpopo, and the source of many of the tributaries of that river. The range is a continuation of the Drakensberg, and the height ranges from 3000 ft. to 1500 ft. In the district are some important goldfields. The chief towns are Leydsdorp and Pietersburg, round which are some rich

coal and copper mines. Zrinyi, Niklas, Count von (1508-66)

will wicked destroyed by a mood metal which will leave the metal which will leave the metal which will leave the harmed. Mazda and Saosha will then overcome Ahriman and the dragon, to become a strolling playwhich, and and overlasting growth and life will take the place of ago, decay, and feath. See Dr. Moulton, Early he death. See Dr. Moulton, Early Reichenau, Switzerland; and in 1798.

Zorrilla y Moral, José (1817-93), a went to Aarau, where he filled everal Spanish poet and dramatist. Born at important nositions. His works in

stschau. · · · 7), and works

appeared in thirty-five volumes, 1851-54.

Zschoppau, a tn. of Saxony, on a inner portion is in progress.

Zschoppau, a tn. of Saxony, on a stream of the same name, tributary to the Mulde, 15 m. S.E. of Chemnitz, with textile manufs. Pop. 6730.

Zuccarelli, Francesco (1702-88), an Anglo-Italian painter, born at Pitigliano in Tuscany. He settled as a young man in England, and soon won great fame by his landscapes, and as a scene-painter at the London Opera House; while he was among the original members of the Royal Academy, founded in 1768. The Glasgow Municipal Museum has a large array of his best works.

large array of his best works. Zuccaro, Federigo (1543-1609), an Italian painter, born at Sant' Angelo; brother and pupil of Taddeo Z. He came to England in 1574 and found various patrons among the nobility, but in 1578 returned to Italy. A fine portrait of Queen Elizabeth, now at Hatfield House, is commonly ascribed to him; while the Glasgow Municipal Museum has a picture which is certainly his, and several others are in the National Gallery. others are in the National Galleryfor instance, one of the Earl of Leicester, and another of Sir Walter Raleigh. He completed Vasari's 'Last Judgment' in the dome of Florence Cathedral; carried out some of Michelangelo's designs for the Pauline Chapel; and decorated the Doge's Palace at Venice (1582) and the Escurial (1585-88). In 1895 he founded the academy of St. Luke at

Rome. Zuffenhausen, a tn. of Würtemberg, Germany, 6 m. from Ludwigsberg. Pop. 12,752. Zug: 1. A canton of Central Switzer-

land. Area 92 sq. m. S. and S.E. are mountainous, the highest peak being the Kaiserstock (\$258 ft.). The rest is in the basin of the Reuss, and possessing suitable grazing and pas-

possessing sintable grazing and pasture, produces butter, cheese, etc. Pop. 28,013. 2. A tn., cap. of above, on lake Zug. Pop. 8038.

Zuider, or Zuyder, Zee, an arm of the North Sea, penetrating into the N.W. Netherlands. Area 2027 sq. m. It consists of an oval inner part and a horn-shaped outer part, joined by a strait about 10 m. wide. A chain of islands.—Texel, Viicland, Terschelling, Ameland, and Schiermonnikoog— Ameland, and Schiermonnikoog—separate it from the North Sea, and are the remains of the original coast-

der drei Bünde in Rhätien, 1798; the 13th century by the sea breaking Stunden der Andact, 1809-16, a rationalistic religious manual, trans- and flooding the lowlands between it lated into English (1843); Des and a small inland lake, with which Color of the floods united. The Zuider Zee is very shallow, the depth never exceeding 40 ft. and being only 3 ft. over large areas. It contains several islands and receives the R. Yssel. A state drainage scheme for reclaiming the

Zukertort, Johann Hermann (1842-88), a chess player, born in the prov. of Riga, of German ancestry, was educated for the medical profession at Breslau. After 1867 he devoted at Bresiau. After 1867 he devoted himself to chess. He edited a journal on the subject at Berlin in 1867-71, and in 1872 went to England, where he founded the Chess Monthly. He won numerous tournaments in London and Paris, but was defeated by Sreinitz in 1885.

Zula, a vil. of Eritrea, on Annesley Bay, also known as the Bay of Adulis or Zula. Near it are the ruins of the ancient Adulis.

Zulia, a state of Venezuela, area 26,000 sq. m. It is a fertile plain, with large forests, watered by the R. Zulia, and containing Lake Maracaibo. Cap. Maracaibo. Pop. 90,000. Züllichau, a fortified tn. of Brandenburg, Prussia, 50 m. S.E. of Frank-

fort-on-the-Oder. Pop. 8035.

Zulus (Amazulus), a S. African people belonging to the Bantu stock. Both physically and intellectually they are a fine race. They are advanced in domestic arts, and their main industries are pastoral, though main industries are pastoral, though iron work, pottery, copper, ivory, horn and wood ornaments, and baskets are made and hides are tanned. The men are of a warlike temperament and exhibit a notably 'sporting spirit.' The standard of morally is high in spite of the universal practice of polygrams. These moranty is night in spite of the universal practice of polygamy. There is an extensive folklore and the unwritten code of laws is well observed. Government is by chief-, through the heads of districts, and the constitution is thoroughly democratic. The importance of the nation dates from the beginning of the 19th continuation. the beginning of the 19th century. when it was organised and led through the chief Chaka, who practically became master of S. Africa from Cape Colony to the Zambesi. He was murdered in 1828 and was succeeded by his brother. Dingaan, who in 1838 brought about a war with the Boers. by whom he was defeated. The next rulers were Umhanda (d. 1873) and Cetewayo, during whose reign war broke out with Great Britain. The Z. gained a victory at Isandula (1879). but were defeated in the same year at line. The Zuider Zee was formed in Ulundi. Cetewayo's son, Dinizulu,

granted a strip of land to the Boers on which they established the 'New Republic,' while the remainder of Zululand was annexed to Great Britain in 1887. Dinizulu was exiled clude gold, copper, iron, and salt. The country was conquered by the countr another rising under Bambaata, was suppressed in 1906. Dinizulu died in 1913. See T. B. Jenkinson's Amazulu, 1882; and Captain J. Stuart's History of the Zulu Rebellion, 1913.

Zululand, a dist. of S. Africa, since Dec. 30, 1897, a prov. of Natal. Area 10,461 sq. m. It includes Tongaland, and is bounded by Vryheid on the W., Swaziland and Portuguese E. Africa on the N., and the Indian Ocean on the E. and S.E. The surface is mainly mountainous. It is watered by the Tugela, Umbalusi, Umvolosi, and Mkusi Rs. There are large forests, and the land is very fertile, corn, beans, sugar, cotton, and coffee being grown. Stock-raising is a growing industry. The mineral wealth is still unworked. The climate is healthy except on the coast, where fever is prevalent. Chief town, Ulundi. Pop. about 235,000 including 1700 Europeans. For history, see Zulus. Zumala-Carréguy, Tomas (1789-

Zumala-Carreguy, 10mas (110) 1835), a Spanish general, born in Guipuzcoa. He fought under Mina der Quesada, In 1832 he

army as a me leader of the Carlist forces in the Basque Provinces, gaining many victories over He was mortally the Cristinos.

wounded at the siege of Bilbao.

Zumpt, August (1815-77), a German
philologist, nephew of Karl Zumpt,
born at Königsberg and educated at Berlin. He was a lecturer at various gymnasia in Berlin. His works, mainly dealing with Latin epigraphy, include Studia Romana: Das Kriminabrecht der römischen Republik, and De 4---- Supplendo.

ob (1792-1849), born at Berlin;

Heidelberg. In

Zungaria, or Dzungaria, a mountainous region of Sin-kinng, China, bordering on Russian Turkestan, and 1900,679. 2. Cap. of above cauton, lying between the Tian-Shan on the S., the Greater Atlai on the N., and the Mongolian Gobi on the E. The surface is mainly a desert and slightly and the town has a fine cathedral hollowed plateau, but there are large and the town has a fine cathedral and a famous university and polytracts of forest, and the plains and technic. It is an important manufacturing afford good pasturage, while bordering on Russian Turkestan, and

Chinese emperor in the 18th century. The inhabitants include the Kalmuck Dzungars and Turgots, and also t Khalkas and Dungans, Chinese and Kirghiz.

Zungeru, the political cap. of N. Nigeria, W. Africa, in Zaria prov., on Kaduna R. in lat. 9° 49' N., long. 6° 9' E. It was made the administrative headquarters in place of Lokoja, still the commercial capital, in 1902. It is connected by railway with Baro, a port on the Lower Niger, open all the year, and with the Lagos

Open an the year, and with the Logor railway by the line to Jebba. Zunz, Loopold (1794-1886), a Jewish scholar, born at Detmold, Germany; studied at Göttingen and Berlin. He held several educational posts in Berlin. His works include: Elucas über die rabbinische Litteratur, 1818; Die gottesdienstlichen Vortrüge der Juden, 1832; and Die Namen der Juden, 1836.

Zurbaran, Francisco (1598-1662), a Spanish painter, a native of Fuente de Cantos. His family were peasants, but growing interested in art he soon left went to

gaged to cathedra : appointe

king, Philip IV., and in consequence the rest of his life was spent chiefly the rest of his life was spent energy at Madrid. Many of his pictures are still in that town, while others are in the Louvre, the Pinakothek, and the National Gallery of Scotland; and nearly all of them are marvels of technical accomplishment, yet do not proclaim the artist gifted with any great investing faculty. great imaginative faculty.
Zürich: 1. A canton of N. Switzer-

land, bordering on Baden. 666 sq. m. Its northern part is open Heidelberg. In and undulating, while the central and southern portions are very monnipro and southern portions are very monnipro tainous, with summits rising to 4000 ft. It forms part of the basin of the Rhine and is also drained by the mat...

Curtius, Quintilian, and several works of Cicero, besides writing several valuable works on classical subjects. culture is carried on in the N., and Targeria on Princeptic a mount manufe of various kinds are carried. and undulating, while the central and manufe, of various kinds are carried on. Pop. (German and Protestant) 500,679. 2. Cap. of above cauton, situated at the exit of the Liminat from Lake Zürich, 60 m. N.E. of Bern.

Zymotic

meannery. Pop. 183,088.
Zurita, Jeronimo (1512-80), a
Spanish historian, born at Saragossa;
educated at Alcala. In 1513 he became a member of the Supreme
Council of Castile, and was sent by the Inquisitor-General on an embassy to Germany. He became beer tary to the Inquisitor in 1547, and in 1549 historiographer of the kingdom and contador-general of the Inquisition in Aragon. He wrote Anales de la Corona de Aragon. 1562-80.

Zutphen, a tn. of prov. Guelderland, ence of the m. N.E. of interesting

Wiin Huis Tower, etc., and near it is the scene of Sir Philip Sidney's death in 1586. Pop. 18,313.

Zuyder Zee, see ZUIDER ZEE. Zvenigorodka, a dist. tn. of Kiev gov., Russia, 100 m. S. of Kiev. Pop. 17,000.

Zvornik, a fort. tn. of Bosnia, on R. Drina, 30 m. from its confluence with the Save and 60 m. N.E. of Sarajevo. Pop. 4500.

Zweibrücken (Fr. Deuxponts), a R. Schwarzbach, 45 m. W. of Landau, formerly cap. of the ancient duchy of Z. It has numerous manufs. and a famous printing-press. Pop. 15,251.

lamons printing-press. Pop. 15,251.
Zwickau: 1. A tn. of Saxony on R. Mulde, 60 m. S.W. of Dresden.
Among its intercting old halldly grant the Mari riticals (1151), the 14th century Katharitenian left, the Town Hall (1581), and the Gewandhaus. It is near large coalfields, and have inverted industrial contravity. naus. It is near large coallields, and is an important industrial centre, with numerous manufs. Pop. 73,152. 2. A tn. of Gabel dist., Bohemia, 19 m. W. of Reichenburg, with large textile manufs. Pop. 5731.

Zwingli, Huldreich, or Ulrich (1484-1531), a Swiss reformer, born at Wildhaus, St. Gall, and educated at Bern, Vienne, and Regal. In 1506 to be

Vienna, and Basel. In 1506 he became parish priest at Glarus, and in 1512 and 1515 went on foreign service as chaplain to Swiss troops let out as mercenaries. His opposition to this mercenary service obliged him to leave Glarus, and in 1516 he went to Einsiedeln, the site of the lamous shrine of the Black Virgin. Here his religious views began to take definite shape, and, when in 1518 he accepted a call to Zürich, they found their first expression in his opposition to Bernhardin Sam-son, a seller of indulgences. His preaching of the plain Gospel became increasingly popular, and he was sup-ported by the civil authorities. In small-pox, measles, scarlet fever, 1520 he issued a pamphlet in favour crysipelas, etc.

produces silk, cotton, paper, and of the work of Luther, in which he machinery. Pop. 189,088. for reform, many of which found widespread support. His influence prevented Zürich from joining the alliance with France in 1521, and in 1523 he defeated in debate the vicarrepresentation in General the Vicar-general of the Bishop of Constance. This success led to the adoption by Zürich of the Reformation as set forth by Z., and another debate later in the same year resulted in still further reforms, while the movement rapidly spread throughout Switzerland. In 1524 Z.'s letter on the Lord's Supper to Matthaus Alber brought to a head the controversy between the Swiss Protestant party, led by himself, and the German party under Luther, and the breach was only widened by the conference at Marburg (1529), arranged by Philip of Hesse. Z. took an active part in the war between Zürich and the Forest Cantons and was killed at Cappel. where his party met with a disastrous defeat. See his Opera, edited by Schuler and Schulthess (1828-61), and Lives by Oswald Myconius (1532, reprinted by Neander 1841), Christoffel (1857), and Mörikofer (1867-69).

(1867-69).

Zwittau, a tn. of Olmutz, Moravia, Austria-Hungary, near the Bohemian frontier, 40 m. N. of Brunn. Manufs. textiles and tobacco. Pop. 9651.

Zwolle, cap. of prov. of Overyssel, Netherlands, on the Zwarte Water, 53 m. N.E. of Amsterdam. The Gothic St. Michael's Church (1406) has a famous organ. The town is an important centre of transit trade, and important centre of transit trade, and important centre of transit trade, and has manufs. of iron and cotton, and shipyards. Near by is Agnetenberg Monastery, the home of Thomas a Kempis. Pop. 34,051.

Zwyndrecht: 1. A western suburb

of Antwerp, on the other side of the

R. Scheldt. It has a strong fort. 2. A tn. of S. Holland, on a trib. of the R. Maas, opposite Dort. Pop. 5500.

Zygophyllaceæ, a natural order of tropical plants, shrubs, and trees, which include the Guaiacum.

Zygostates, a genus of epiphytal orchids. Z. greeniana, which bears white flowers with white and green lips in racemes, is sometimes grown in the stovehouse.

Zymotic (ζύμη, ferment), a term applied to diseases caused by the vital activity of certain micro-organisms. It was originally intended by Dr. Farr, the inventor of the term. to designate diseases promoted by processes analogous to fermentation. It is now applied to the chief acute infectious diseases: typhoid, cholera,

ADDENDUM

Psychology may be broadly defined as the science of mind. The word is derived from the Greek, and means the science of the soul. But in the course of time the word soul has undergone so many changes in mean-ing, that it is now too vague and hypothetical a term to take a place in what professes to be a natural science. Mind, therefore, is used as meaning that unity which holds together and combines the several states which we call psychical phenomeno'; it being mecessary to note that the question as to what mind is, lies really in the province of philosophy, P. only being concerned with the phenomena of soul. Logic, however, led some men to think that if we could describe completely the nervous system of a man, and know the chemical and physical law governing it, then we would know apoverning it, then we would know that man. Huxley is, of course, the great protagonist of this view, which mere combines the several states which we call psychical phenomena of side to the definition adopted by connecessary to note that the question as siderations of this type are: (I) that the psychical and physical processes form two parallel series of appearances, for one and physical processes form two said to be a science of mind. Therefore the definition adopted by said to be a science of mind. Therefore the definition adopted by said to be a science of mind. Therefore the definition adopted by science of state of this type are: (I) that the psychical processes form two parallel series of appearances, for one and physical processes form two said to be a science of mind. Therefore the definition adopted by science of same thing. This is the hypothesis of the behaviour of living thiness. How psycho-physical parallelism, but physical processes are the processes are not reacted to the lidea that psychical and physical processes form two parallel series of appearances, for one same thing. This is the hypothesis of the behaviour of living thiness. How psycho-physical parallelism, but physical processes are not reacted that the psychi ever defined though, it must be recognised or properly studied, leads mised that P. deals with the pheto to the idea that psychical and nomena of mind, or with states of physical processes react or interconsciousness. It cannot be defined act on each older, i.e. the hypothesis or leads into one of the deepest it can be seen that from the natural phases of P., viz. whether mental side view, psychologists have graduphenomena are always states of consciousness or whether there are some it is recognised that the primary which are unconscious and which do basis lies in introspective P., and that not enter into our experience. We can any objective methods must Prenot enter into our experience. We can any objective methods must prothink that mind is immaterial and suppose, and be based upon, accurate exists, not in space, but in time only; subjective methods (see SUBJET). P. but we must remember that there is a forms the basis of a number of strong connection between mind and practical sciences, the chief of which accompanied by nervous action, and while we must be careful to be clear; enough in our thinking not to regard psychical and physical assynonymous, vet we must regard mind as being inexplicably related to the living dealing with recling, asthetic; and abeing by means of the nervous system or its actions. So we arrive at a grave difficulty, Physiological P, has of Psychology: M'Douxall, Phosiological P, has of Psychology: M'Douxall, Phosiological physical parallelism. It is known that the nervous processes of the spinal cord, and that they consist in transmitting physical and that G. F. Storr, Manual of Psychology will push they consist in transmitting physical and Analytical Psychology. William Manual the process is accompanied by neural process. This also Emorioss, Philiams, Miniory, law of psycho-neural parallelism has, Supper, and Wills. psychical and physical assynonymous,

All mental processes are is calucation (q.r.), this dealing with · mind on all

g, feeling, and s branches, P. ing, forms the